

PIA is losing 2 crore PKR per hour nowadays. Made in 1954. PIA was an emerging airline and it was good at start because there is no competitor at that time as there was no airline in gulf. Emirates was made after 1986, ittehat was made in 1990s.

PIA has do zero maintenance of their planes due to low budget, they spend more and earn less. One reason of less earning is:

—> they have just 24 planes. At first they have 48 planes. Among 24, 16 are operational, so that's why planes are less in number

—> other airlines do outsourcing of their maintenance and customer services but in pakistan there is no such facility. Everything is done inhome, that's why they are unable to manage properly.

### **EXCESSIVE STAFF:**

If we just fire the staff of service handling, about 4000 people will be removed from PIA. About 1500 people are for kitchen handling, and in all other countries, these services are outsourced.

Even PIA has its own medical division. There is a general manager, alot of doctors and nurses and other medical staff. This medical staff cover working and retired employees of PIA, although medical facilities are provided by state. At first, they even have diagnostic labs and hospitals where some surgeries also took placed.

PIA has its own printing press and even horticulture center. These employees were first appointed as normal workers but noe they are progressed to become officers in PIA. And that most surprise thing is that all these workers are officially part of PIA employees and they get same facilities as the core employees of PIA get. For kitchen, PIA had its own poultry farm but now it is closed.

We only need supervisors but we are losing a lot of money because we are not doing outsourcing. The employees who are doing core functions are also excessive in number.

### **RISE OF PROBLEMS:**

Actually, problems arises from 1991 when there was an era of Nawaz Sharif. He was inspired by the airport of singapore. Singapore is a city state so they did open sky (means a country can easily operate unlimited flights to and from that state). Nawas sharif announced that we will also do open skying in Karachi. Dubai, singapore, morocco and all other city states required open skying so that alot of passengers come to visit and they earn money from them. But Pakistan is not a city state. So open skying is not good for us. But the good thing is that after facing alot of losses, open skying were stopped.

PIA employees has a bad mentality. The managers consider themselves as commissioners and are not in a condition to compete. Because at first when there was no gulf airlines, there was no competitor but due to emergence of emirates, qatar airlines and tawaqqal, PIA was lost completely.

PIA faced 800 Arab rupee loss and if PIA earn profit for 100 years but still it wouldn't be able to fulfil that loss. Every minister is in the thought to improve PIA just for 2 to 3 months so that he can become a good minister in front of people but no one has made a single attempt to made a long lasting strategy to improve permanently.

If 10 planes can carry only 15 flights they claim that we can carry 40 flights. The code sharing scheme of pia and THY was not accepted by gulf airlines and they stand a huge strike and this scheme was dropped by pia and thy but if it was not dropped pia was able to apply for star airlines.

If this scheme was not dropped pia can bring their flights to Bangkok dhaka and Bengal which can reduce highly gap between PIA and star airlines standard which was a very good step but gulf airlines became a huge unbreakable blockage.

Associations and unions start dictation outside the airport and due to this passengers were unable to go in and out and flights started to stop. This was a huge pressure on PIA so that scheme was dropped.

PELPA pilots association mafia and due to their semi god like behaviour, they don't compromise on duty Timmig more than 10 hours and when time is like 10 to fifteen minutes greater than 10 hours they say we need a break, and PIA have to pay to them. The other thing pia pilots say we can't work more than 30 hours weekly.

PIA faced difficulty in serving the employee, there mafia attitude was a big reason behind downfall. PIA staff manager doesn't even visited their offices as they we in self served palaces their attitude and behavior being as we are God father of PIA we can do what ever we want.

New staff hiring also creates problems due to lack of experience.

Another reason was PIA salaries which was very very low, only 6% of revenue from which 1.25 percent includes pilot salaries and pilots are round about 200-250 of whole PIA staff.

Corruption is one of the most issue that PIA is facing. They demand for the same equipment for 3 to 4 time but they buy only one time and other payments they take by their self.

## RESULT OF SURVEYS:

In 2011, there was a survey from many international passengers. Actually survey mostly covers 10-15% of passengers but this survey cover about 98% of passengers. They are provided with questionnaire and asked why they selected other airlines instead of PIA. Actually these passengers also travelled in PIA for one or two times. The outcome of the survey includes interesting facts because the outcome is that:

- PIA has a very bad service
- number of flights per week is a huge problem
- PIA don't serve alot of destinations. In germany, there are about 5-6 destinations where Pakistanis mostly visit but PIA only covers one to two destinations from it, it means we are losing a lot of passengers.
- many international passengers who are students said that they don't want to travel in PIA because they are not served with alcohol.

## BANS ON PIA:

In 2008, PIA was banned from Europe and it is a very big issue because Europe is a big hub for us. Because of security issues. Civil aviation authority of EU noticed that the plane has a maintenance issue but we neglected that warning and next time again take off that plane to Rome which create serious problem.

## **SOLUTION:**

After 2008, we did nothing but losing money. The criterion of every government is to privatise departments. In recent years, PIA consider to progress by unveiling and printing the news of fake degree scandals. But this is not a solution, you need to rebuild airline, have to buy new planes and need a lot of maintenance.

PIA should need a lot of outsourcing for managing kitchen, maintenance and many more.

Streamlining operations, optimizing flight schedules, and ensuring on-time departures can improve efficiency and customer satisfaction. This includes maintenance of aircraft to prevent delays and cancellations.

Buying new planes can reduce the issue of timetable and departure of flights.

Embrace technology advancements to improve booking systems, enhance in-flight entertainment, and offer more personalized services to passengers.

Investing in effective marketing campaigns and strengthening the brand image can attract more passengers and create positive perceptions in the market.

## **SOLVING PROBLEMS USING 6 SIGMA:**

DMAIC (Define, Measure, Analyze, Improve, Control) is a structured problem-solving methodology used in Six Sigma. Applying DMAIC to PIA (Pakistan International Airlines) can do a lot of improvements.

### **DEFINE:**

First of all in this phase, select one problem to solve. We have accentuated a lot of problems above. Let's consider the issue of number of flights per week and flight delays because they are the main reason that reduces the amount of passengers to travel. Clearly outlines the goals and objectives to solve that issue.

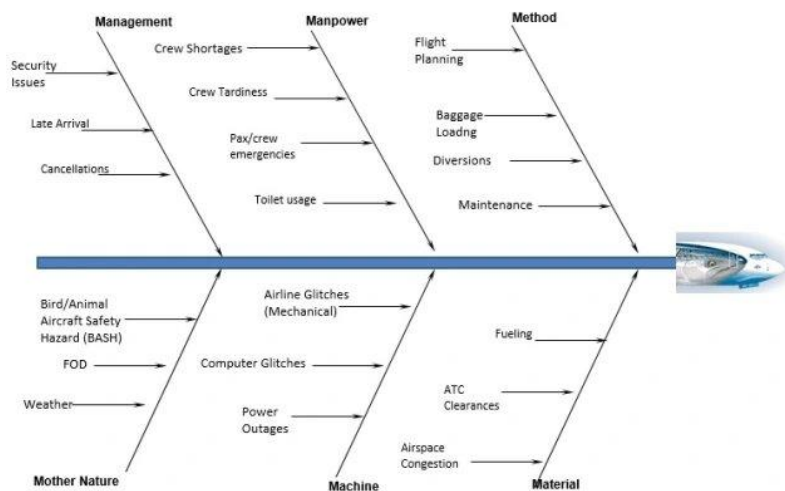
### **MEASURE:**

This phase involves Gathering and analysing relevant data to that issue. In this case, checking the past history of flight delays and problems created by the issue of less number of flights per week.

- **Around 250 flights were canceled between 14 and 22 October, 2023. But the irony is the aviation ministry and PIA administration are mysteriously silent and have no answers to the questions on the crisis.**
- **71 flights of PIA were canceled in one day in 2023, so much uncertainty was not seen even during COVID-19.**
- **The national flag carrier is facing arguably its worst crisis in history as Pakistan State Oil (PSO) has cut the fuel supply over unpaid dues.**

### **ANALYZE:**

This phase involves using mathematical tools and terminologies to analyse the data collected. In this case, if flight delays are an issue, analyze the reasons behind them which may be maintenance issues, scheduling problems, or other factors. Most flight delays occur due to maintenance issue. In past when PIA was banned from Europe, maintenance was the main issue. PIA flew the plane that was out of order first to UK and then to Rome. If the plane was first to go to maintenance, then the reason of next flight cancellation issues arose due to the low number of planes.



### IMPROVE:

This involves developing and implementing solutions based on the analysis. This might involve process improvements, changes in procedures, or introducing new technologies.

In case of flight delays and maintenance issues, the solution that emerges is to buy new planes. But this issue is related to the issue of less budget. Budget can be improved by:

- Getting help from government.
- Reducing the expenses of PIA itself. For example: as mentioned above that PIA has its own printing press department, horticulture department and hospital, it has to reduce those expenses. The medical facilities of working employees and current employees is the duty of government, not the department in which they are serving.

By getting improvement in budget, PIA should:

- Buy new planes and advanced technologies
- Advanced technologies should help to guess some unpredicted conditions such as the exact weather of a week or two so that system should take precautionary measures.

### CONTROL:

This phase involves establishing control mechanisms to monitor the effectiveness of the implemented solutions continuously. Implement checks and balances to ensure that the improvements remain consistent over time.

After getting some improvements, regular audits and feedbacks from passengers should be taken on regular intervals so that any other problem can be improved.



# UNIVERSITY OF SARGODHA

## **Project Title**

BPE : Airlines Management System

Submitted to: SIR SAUD BIN TAHIR

Submitted by: Nimra Iman (BSSE51F21S004)

Syeda Tayyaba Rubab (BSSE51F21S023)

# BPE Airlines Management System Documentation

## Project Title

BPE : Airlines Management System

## Project Purpose

We created a system to help airlines work better. It makes booking flights, managing crews, and helping passengers easier.

### Contents

1. Introduction
2. What We're Doing
3. How It Works
4. What It Does
5. Who Uses It
6. What We Used
7. How We Store Info
8. How It Looks
9. How We Keep It Safe
10. Making Sure It Works

#### 1. Introduction

Our goal is to make airlines better. We made a system that helps with booking flights, managing crews, and making passengers happy.

#### 2. What We're Doing

Our system covers everything airlines need: booking flights, managing crews, helping passengers, and even checking how things are going.

#### 3. How It Works

Airlines in Pakistan including PIA have many flaws therefore we have decided to make a system that is more flexible in its management and everything.

#### 4. What It Does

It helps with booking flights, making sure crews are where they need to be, tracking baggage, checking in passengers, and showing real-time flight updates. There's also a dashboard for airlines to see how things are going.

#### 5. Who Uses It

Different people use the system. Some manage everything, some take care of flights, some help passengers, and some just want to check their flight info.

#### 6. What We Used

We used some tools to build this - like **six sigma**, **DMAIC**, and **MySQL** to store information.

### 7. How We Store Info

We keep information in a smart way using PostgreSQL. It has different tables for flights, bookings, passengers, and crews.

### 8. How It Looks

The system looks nice and is easy to use on computers or phones. We made sure it works well for everyone.

### 9. How We Keep It Safe

We put on a virtual lock and key to keep information safe. Only the right people can access it.

### 10. Making Sure It Works

We tested it a lot to make sure it doesn't have problems. Like checking each part to make sure it does its job.

### 11. Getting It Out There

We put it on the internet so airlines can use it. It's like setting up a shop - now everyone can come and use it.

## Overview

Our system helps airlines be better, which is what the business plan wants. Involves deciding the name, type of planes and other parameters.

## Production

It helps airlines work well by managing crews, saving money, and making sure everything runs smoothly.

## Marketing

Airlines can use our system to make passengers happy and show they're a good choice. This helps them attract more customers.

## Financials

Our system can save airlines money by making things more efficient. This is good for their finances.

## Scalability

Our system can grow with airlines if they get bigger. It's like adding more rooms to a house when the family grows.



Our system is here to make airlines better. It helps with booking flights, managing crews, and making passengers happy. It fits with what airlines want to achieve.

# UNIVERSITY OF SARGODHA

## **Assignment of Entrepreneurship**

Submitted by:

MAHNOOR FATIMA  
(BSSE51F21S011)

Submitted to:

Mr. Badar

**Identified Issue:**

David notices a problem with plastic pollution in oceans and waterways, mostly from single-use plastic bottles.

**Proposed Solution:**

He introduces the "EcoHydrate Bottle," a water bottle made from plant-based materials that break down naturally and can be used in compost.

**Background and Resources:**

David studied environmental science and researched sustainable materials and production methods. He teamed up with a bioengineering company to create the EcoHydrate Bottle and got patents for his technology.

**First mover Advantage:**

Although there are other eco-friendly bottles out there, the EcoHydrate Bottle stands out for being both biodegradable and compostable. People like that David cares about the environment.

**Value created:**

The EcoHydrate Bottle offers a green option to regular plastic bottles, reducing waste and helping the environment.

**Financial Numbers:**

David's company made \$200,000 in sales last year, with a profit of 30%. He wants \$300,000 for a 25% stake to expand marketing and production.

**Further Suggestions:**

The investors like David's idea but worry about costs and growth. They suggest teaming up with beverage companies or stores to reach more people and cut costs. In the end, Kevin O'Leary offers \$300,000 for a 30% stake, promising to help David expand his business smartly.

# UNIVERSITY OF SARGODHA

## **Assignment of Entrepreneurship**

Submitted by:

NIMRA IMAN  
(BSSE51F21S004)

Submitted to:

Mr. Badar

## **Entrepreneurs: Sarah and Jason Thompson**

### **Problem identified:**

Sarah and Jason identify the problem of food waste in households, where a significant amount of food is thrown away due to spoilage or improper storage.

### **Solution or product in return:**

They present their solution, the "FreshSaver Vacuum Sealer," a compact vacuum sealing system that extends the shelf life of perishable foods by removing air and sealing them in airtight bags. Pasteurised food preservation techniques require different temperature for different food products, so these "FreshSaver Vacuum Sealer" take care of it.

### **Knowledge and resources:**

Sarah has a background in culinary arts, and Jason has experience in product design and manufacturing. They have spent years researching food preservation methods and developing prototypes for the FreshSaver Vacuum Sealer.

### **First mover Advantage:**

While vacuum sealers are available on the market, FreshSaver's sleek design and user-friendly features set it apart. Sarah and Jason's focus on simplicity and affordability make their product appealing to a wide range of consumers.

### **Value created:**

The FreshSaver Vacuum Sealer helps households reduce food waste and save money by extending the freshness of perishable items such as fruits, vegetables, and meats.

### **Financial Numbers:**

Sarah and Jason's company has generated \$300,000 in revenue in the past year, with a net profit of 25%. They are seeking a \$500,000 investment in exchange for a 20% equity stake to fund marketing initiatives and expand distribution channels.

### **Any further suggestion:**

The Sharks are impressed by Sarah and Jason's product but express concerns about market saturation and competition from larger appliance manufacturers. They suggest focusing on building brand awareness and loyalty through targeted advertising and social media campaigns. Ultimately, one shark makes an offer, and Sarah and Jason accept a deal for \$500,000 in exchange for a 25% equity stake. Shark agrees to provide funding and guidance to help them scale their business and navigate the competitive landscape in the kitchen appliance industry.

PIA is losing 2 crore PKR per hour nowadays. Made in 1954. PIA was an emerging airline and it was good at start because there is no competitor at that time as there was no airline in gulf. Emirates was made after 1986, ittehat was made in 1990s.

PIA has do zero maintenance of their planes due to low budget, they spend more and earn less. One reason of less earning is:

—> they have just 24 planes. At first they have 48 planes. Among 24, 16 are operational, so that's why planes are less in number

—> other airlines do outsourcing of their maintenance and customer services but in pakistan there is no such facility. Everything is done inhome, that's why they are unable to manage properly.

### **EXCESSIVE STAFF:**

If we just fire the staff of service handling, about 4000 people will be removed from PIA. About 1500 people are for kitchen handling, and in all other countries, these services are outsourced.

Even PIA has its own medical division. There is a general manager, alot of doctors and nurses and other medical staff. This medical staff cover working and retired employees of PIA, although medical facilities are provided by state. At first, they even have diagnostic labs and hospitals where some surgeries also took placed.

PIA has its own printing press and even horticulture center. These employees were first appointed as normal workers but noe they are progressed to become officers in PIA. And the most surprise thing is that all these workers are officially part of PIA employees and they get same facilities as the core employees of PIA get. For kitchen, PIA had its own poultry farm but now it is closed.

We only need supervisors but we are losing a lot of money because we are not doing outsourcing. The employees who are doing core functions are also excessive in number.

### **RISE OF PROBLEMS:**

Actually, problems arises from 1991 when there was an era of Nawaz Sharif. He was inspired by the airport of singapore. Singapore is a city state so they did open sky (means a country can easily operate unlimited flights to and from that state). Nawas sharif announced that we will also do open skying in Karachi. Dubai, singapore, morocco and all other city states required open skying so that alot of passengers come to visit and they earn money from them. But Pakistan is not a city state. So open skying is not good for us. But the good thing is that after facing alot of losses, open skying were stopped.

PIA employees has a bad mentality. The managers consider themselves as commissioners and are not in a condition to compete. Because at first when there was no gulf airlines, there was no competitor but due to emergence of emirates, qatar airlines and tawaqqal, PIA was lost completely.

PIA faced 800 Arab rupee loss and if PIA earn profit for 100 years but still it wouldn't be able to fulfil that loss. Every minister is in the thought to improve PIA just for 2 to 3 months so that he can become a good minister in front of people but no one has made a single attempt to made a long lasting strategy to improve permanently.

If 10 planes can carry only 15 flights they claim that we can carry 40 flights. The code sharing scheme of pia and THY was not accepted by gulf airlines and they stand a huge strike and this scheme was dropped by pia and thy but if it was not dropped pia was able to apply for star airlines.

If this scheme was not dropped pia can bring their flights to Bangkok dhaka and Bengal which can reduce highly gap between PIA and star airlines standard which was a very good step but gulf airlines became a huge unbreakable blockage.

Associations and unions start dictation outside the airport and due to this passengers were unable to go in and out and flights started to stop. This was a huge pressure on PIA so that scheme was dropped.

PELPA pilots association mafia and due to their semi god like behaviour, they don't compromise on duty Timmig more than 10 hours and when time is like 10 to fifteen minutes greater than 10 hours they say we need a break, and PIA have to pay to them. The other thing pia pilots say we can't work more than 30 hours weekly.

PIA faced difficulty in serving the employee, there mafia attitude was a big reason behind downfall. PIA staff manager doesn't even visited their offices as they we in self served palaces their attitude and behavior being as we are God father of PIA we can do what ever we want.

New staff hiring also creates problems due to lack of experience.

Another reason was PIA salaries which was very very low, only 6% of revenue from which 1.25 percent includes pilot salaries and pilots are round about 200-250 of whole PIA staff.

Corruption is one of the most issue that PIA is facing. They demand for the same equipment for 3 to 4 time but they buy only one time and other payments they take by their self.

## RESULT OF SURVEYS:

In 2011, there was a survey from many international passengers. Actually survey mostly covers 10-15% of passengers but this survey cover about 98% of passengers. They are provided with questionnaire and asked why they selected other airlines instead of PIA. Actually these passengers also travelled in PIA for one or two times. The outcome of the survey includes interesting facts because the outcome is that:

- PIA has a very bad service
- number of flights per week is a huge problem
- PIA don't serve alot of destinations. In germany, there are about 5-6 destinations where Pakistanis mostly visit but PIA only covers one to two destinations from it, it means we are losing a lot of passengers.
- many international passengers who are students said that they don't want to travel in PIA because they are not served with alcohol.

## BANS ON PIA:

In 2008, PIA was banned from Europe and it is a very big issue because Europe is a big hub for us. Because of security issues. Civil aviation authority of EU noticed that the plane has a maintenance issue but we neglected that warning and next time again take off that plane to Rome which create serious problem.

## **SOLUTION:**

After 2008, we did nothing but losing money. The criterion of every government is to privatise departments. In recent years, PIA consider to progress by unveiling and printing the news of fake degree scandals. But this is not a solution, you need to rebuild airline, have to buy new planes and need a lot of maintenance.

PIA should need a lot of outsourcing for managing kitchen, maintenance and many more.

Streamlining operations, optimizing flight schedules, and ensuring on-time departures can improve efficiency and customer satisfaction. This includes maintenance of aircraft to prevent delays and cancellations.

Buying new planes can reduce the issue of timetable and departure of flights.

Embrace technology advancements to improve booking systems, enhance in-flight entertainment, and offer more personalized services to passengers.



Investing in effective marketing campaigns and strengthening the brand image can attract more passengers and create positive perceptions in the market.

## **SOLVING PROBLEMS USING 6 SIGMA:**

DMAIC (Define, Measure, Analyze, Improve, Control) is a structured problem-solving methodology used in Six Sigma. Applying DMAIC to PIA (Pakistan International Airlines) can do a lot of improvements.

### **DEFINE:**

First of all in this phase, select one problem to solve. We have accentuated a lot of problems above. Let's consider the issue of number of flights per week and flight delays because they are the main reason that reduces the amount of passengers to travel. Clearly outlines the goals and objectives to solve that issue.

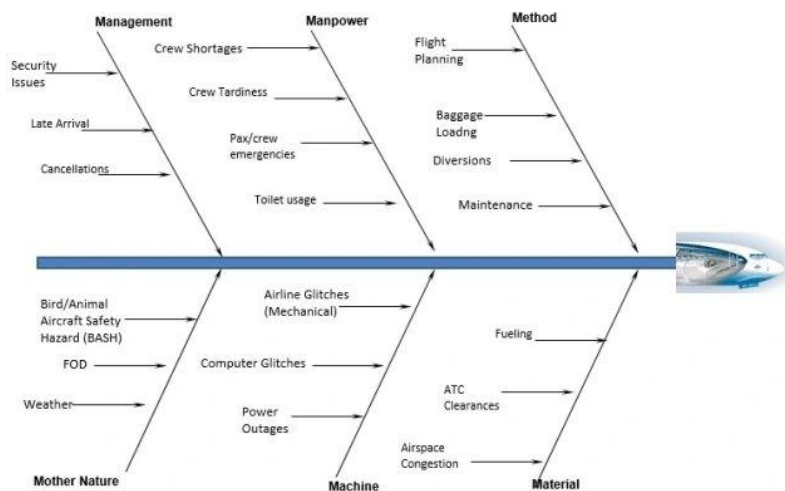
### **MEASURE:**

This phase involves Gathering and analysing relevant data to that issue. In this case, checking the past history of flight delays and problems created by the issue of less number of flights per week.

- **Around 250 flights were canceled between 14 and 22 October, 2023. But the irony is the aviation ministry and PIA administration are mysteriously silent and have no answers to the questions on the crisis.**
- **71 flights of PIA were canceled in one day in 2023, so much uncertainty was not seen even during COVID-19.**
- **The national flag carrier is facing arguably its worst crisis in history as Pakistan State Oil (PSO) has cut the fuel supply over unpaid dues.**

### **ANALYZE:**

This phase involves using mathematical tools and terminologies to analyse the data collected. In this case, if flight delays are an issue, analyze the reasons behind them which may be maintenance issues, scheduling problems, or other factors. Most flight delays occur due to maintenance issue. In past when PIA was banned from Europe, maintenance was the main issue. PIA flew the plane that was out of order first to UK and then to Rome. If the plane was first to go to maintenance, then the reason of next flight cancellation issues arose due to the low number of planes.



### IMPROVE:

This involves developing and implementing solutions based on the analysis. This might involve process improvements, changes in procedures, or introducing new technologies.

In case of flight delays and maintenance issues, the solution that emerges is to buy new planes. But this issue is related to the issue of less budget. Budget can be improved by:

- Getting help from government.
- Reducing the expenses of PIA itself. For example: as mentioned above that PIA has its own printing press department, horticulture department and hospital, it has to reduce those expenses. The medical facilities of working employees and current employees is the duty of government, not the department in which they are serving.

By getting improvement in budget, PIA should:

- Buy new planes and advanced technologies
- Advanced technologies should help to guess some unpredicted conditions such as the exact weather of a week or two so that system should take precautionary measures.

### CONTROL:

This phase involves establishing control mechanisms to monitor the effectiveness of the implemented solutions continuously. Implement checks and balances to ensure that the improvements remain consistent over time.

After getting some improvements, regular audits and feedbacks from passengers should be taken on regular intervals so that any other problem can be improved.



# UNIVERSITY OF SARGODHA

## **Project Title**

BPE : Airlines Management System

Submitted to: SIR SAUD BIN TAHIR

Submitted by: Nimra Iman (BSSE51F21S004)

Syeda Tayyaba Rubab (BSSE51F21S023)

# BPE Airlines Management System Documentation

## Project Title

BPE : Airlines Management System

## Project Purpose

We created a system to help airlines work better. It makes booking flights, managing crews, and helping passengers easier.

### Contents

1. Introduction
2. What We're Doing
3. How It Works
4. What It Does
5. Who Uses It
6. What We Used
7. How We Store Info
8. How It Looks
9. How We Keep It Safe
10. Making Sure It Works

#### 1. Introduction

Our goal is to make airlines better. We made a system that helps with booking flights, managing crews, and making passengers happy.

#### 2. What We're Doing

Our system covers everything airlines need: booking flights, managing crews, helping passengers, and even checking how things are going.

#### 3. How It Works

Airlines in Pakistan including PIA have many flaws therefore we have decided to make a system that is more flexible in its management and everything.

#### 4. What It Does

It helps with booking flights, making sure crews are where they need to be, tracking baggage, checking in passengers, and showing real-time flight updates. There's also a dashboard for airlines to see how things are going.

#### 5. Who Uses It

Different people use the system. Some manage everything, some take care of flights, some help passengers, and some just want to check their flight info.

#### 6. What We Used

We used some tools to build this - like **six sigma**, **DMAIC**, and **MySQL** to store information.

### 7. How We Store Info

We keep information in a smart way using PostgreSQL. It has different tables for flights, bookings, passengers, and crews.

### 8. How It Looks

The system looks nice and is easy to use on computers or phones. We made sure it works well for everyone.

### 9. How We Keep It Safe

We put on a virtual lock and key to keep information safe. Only the right people can access it.

### 10. Making Sure It Works

We tested it a lot to make sure it doesn't have problems. Like checking each part to make sure it does its job.

### 11. Getting It Out There

We put it on the internet so airlines can use it. It's like setting up a shop - now everyone can come and use it.

## Overview

Our system helps airlines be better, which is what the business plan wants. Involves deciding the name, type of planes and other parameters.

## Production

It helps airlines work well by managing crews, saving money, and making sure everything runs smoothly.

## Marketing

Airlines can use our system to make passengers happy and show they're a good choice. This helps them attract more customers.

## Financials

Our system can save airlines money by making things more efficient. This is good for their finances.

## Scalability

Our system can grow with airlines if they get bigger. It's like adding more rooms to a house when the family grows.

Our system is here to make airlines better. It helps with booking flights, managing crews, and making passengers happy. It fits with what airlines want to achieve.

# UNIVERSITY OF SARGODHA

## **Assignment of Entrepreneurship**

Submitted by:

MAHNOOR FATIMA  
(BSSE51F21S011)

Submitted to:

Mr. Badar

**Identified Issue:**

David notices a problem with plastic pollution in oceans and waterways, mostly from single-use plastic bottles.

**Proposed Solution:**

He introduces the "EcoHydrate Bottle," a water bottle made from plant-based materials that break down naturally and can be used in compost.

**Background and Resources:**

David studied environmental science and researched sustainable materials and production methods. He teamed up with a bioengineering company to create the EcoHydrate Bottle and got patents for his technology.

**First mover Advantage:**

Although there are other eco-friendly bottles out there, the EcoHydrate Bottle stands out for being both biodegradable and compostable. People like that David cares about the environment.

**Value created:**

The EcoHydrate Bottle offers a green option to regular plastic bottles, reducing waste and helping the environment.

**Financial Numbers:**

David's company made \$200,000 in sales last year, with a profit of 30%. He wants \$300,000 for a 25% stake to expand marketing and production.

**Further Suggestions:**

The investors like David's idea but worry about costs and growth. They suggest teaming up with beverage companies or stores to reach more people and cut costs. In the end, Kevin O'Leary offers \$300,000 for a 30% stake, promising to help David expand his business smartly.



# UNIVERSITY OF SARGODHA

## **Assignment of Entrepreneurship**

Submitted by:

NIMRA IMAN  
(BSSE51F21S004)

Submitted to:

Mr. Badar

## **Entrepreneurs: Sarah and Jason Thompson**

### **Problem identified:**

Sarah and Jason identify the problem of food waste in households, where a significant amount of food is thrown away due to spoilage or improper storage.

### **Solution or product in return:**

They present their solution, the "FreshSaver Vacuum Sealer," a compact vacuum sealing system that extends the shelf life of perishable foods by removing air and sealing them in airtight bags. Pasteurised food preservation techniques require different temperature for different food products, so these "FreshSaver Vacuum Sealer" take care of it.

### **Knowledge and resources:**

Sarah has a background in culinary arts, and Jason has experience in product design and manufacturing. They have spent years researching food preservation methods and developing prototypes for the FreshSaver Vacuum Sealer.

### **First mover Advantage:**

While vacuum sealers are available on the market, FreshSaver's sleek design and user-friendly features set it apart. Sarah and Jason's focus on simplicity and affordability make their product appealing to a wide range of consumers.

### **Value created:**

The FreshSaver Vacuum Sealer helps households reduce food waste and save money by extending the freshness of perishable items such as fruits, vegetables, and meats.

### **Financial Numbers:**

Sarah and Jason's company has generated \$300,000 in revenue in the past year, with a net profit of 25%. They are seeking a \$500,000 investment in exchange for a 20% equity stake to fund marketing initiatives and expand distribution channels.

### **Any further suggestion:**

The Sharks are impressed by Sarah and Jason's product but express concerns about market saturation and competition from larger appliance manufacturers. They suggest focusing on building brand awareness and loyalty through targeted advertising and social media campaigns. Ultimately, one shark makes an offer, and Sarah and Jason accept a deal for \$500,000 in exchange for a 25% equity stake. Shark agrees to provide funding and guidance to help them scale their business and navigate the competitive landscape in the kitchen appliance industry.

PIA is losing 2 crore PKR per hour nowadays. Made in 1954. PIA was an emerging airline and it was good at start because there is no competitor at that time as there was no airline in gulf. Emirates was made after 1986, ittehat was made in 1990s.

PIA has do zero maintenance of their planes due to low budget, they spend more and earn less. One reason of less earning is:

—> they have just 24 planes. At first they have 48 planes. Among 24, 16 are operational, so that's why planes are less in number

—> other airlines do outsourcing of their maintenance and customer services but in pakistan there is no such facility. Everything is done inhome, that's why they are unable to manage properly.

### **EXCESSIVE STAFF:**

If we just fire the staff of service handling, about 4000 people will be removed from PIA. About 1500 people are for kitchen handling, and in all other countries, these services are outsourced.

Even PIA has its own medical division. There is a general manager, alot of doctors and nurses and other medical staff. This medical staff cover working and retired employees of PIA, although medical facilities are provided by state. At first, they even have diagnostic labs and hospitals where some surgeries also took placed.

PIA has its own printing press and even horticulture center. These employees were first appointed as normal workers but noe they are progressed to become officers in PIA. And the most surprise thing is that all these workers are officially part of PIA employees and they get same facilities as the core employees of PIA get. For kitchen, PIA had its own poultry farm but now it is closed.

We only need supervisors but we are losing a lot of money because we are not doing outsourcing. The employees who are doing core functions are also excessive in number.

### **RISE OF PROBLEMS:**

Actually, problems arises from 1991 when there was an era of Nawaz Sharif. He was inspired by the airport of singapore. Singapore is a city state so they did open sky (means a country can easily operate unlimited flights to and from that state). Nawas sharif announced that we will also do open skying in Karachi. Dubai, singapore, morocco and all other city states required open skying so that alot of passengers come to visit and they earn money from them. But Pakistan is not a city state. So open skying is not good for us. But the good thing is that after facing alot of losses, open skying were stopped.

PIA employees has a bad mentality. The managers consider themselves as commissioners and are not in a condition to compete. Because at first when there was no gulf airlines, there was no competitor but due to emergence of emirates, qatar airlines and tawaqqal, PIA was lost completely.

PIA faced 800 Arab rupee loss and if PIA earn profit for 100 years but still it wouldn't be able to fulfil that loss. Every minister is in the thought to improve PIA just for 2 to 3 months so that he can become a good minister in front of people but no one has made a single attempt to made a long lasting strategy to improve permanently.

If 10 planes can carry only 15 flights they claim that we can carry 40 flights. The code sharing scheme of pia and THY was not accepted by gulf airlines and they stand a huge strike and this scheme was dropped by pia and thy but if it was not dropped pia was able to apply for star airlines.

If this scheme was not dropped pia can bring their flights to Bangkok dhaka and Bengal which can reduce highly gap between PIA and star airlines standard which was a very good step but gulf airlines became a huge unbreakable blockage.

Associations and unions start dictation outside the airport and due to this passengers were unable to go in and out and flights started to stop. This was a huge pressure on PIA so that scheme was dropped.

PELPA pilots association mafia and due to their semi god like behaviour, they don't compromise on duty Timmig more than 10 hours and when time is like 10 to fifteen minutes greater than 10 hours they say we need a break, and PIA have to pay to them. The other thing pia pilots say we can't work more than 30 hours weekly.

PIA faced difficulty in serving the employee, there mafia attitude was a big reason behind downfall. PIA staff manager doesn't even visited their offices as they we in self served palaces their attitude and behavior being as we are God father of PIA we can do what ever we want.

New staff hiring also creates problems due to lack of experience.

Another reason was PIA salaries which was very very low, only 6% of revenue from which 1.25 percent includes pilot salaries and pilots are round about 200-250 of whole PIA staff.

Corruption is one of the most issue that PIA is facing. They demand for the same equipment for 3 to 4 time but they buy only one time and other payments they take by their self.

## RESULT OF SURVEYS:

In 2011, there was a survey from many international passengers. Actually survey mostly covers 10-15% of passengers but this survey cover about 98% of passengers. They are provided with questionnaire and asked why they selected other airlines instead of PIA. Actually these passengers also travelled in PIA for one or two times. The outcome of the survey includes interesting facts because the outcome is that:

- PIA has a very bad service
- number of flights per week is a huge problem
- PIA don't serve alot of destinations. In germany, there are about 5-6 destinations where Pakistanis mostly visit but PIA only covers one to two destinations from it, it means we are losing a lot of passengers.
- many international passengers who are students said that they don't want to travel in PIA because they are not served with alcohol.

## BANS ON PIA:

In 2008, PIA was banned from Europe and it is a very big issue because Europe is a big hub for us. Because of security issues. Civil aviation authority of EU noticed that the plane has a maintenance issue but we neglected that warning and next time again take off that plane to Rome which create serious problem.

## **SOLUTION:**

After 2008, we did nothing but losing money. The criterion of every government is to privatise departments. In recent years, PIA consider to progress by unveiling and printing the news of fake degree scandals. But this is not a solution, you need to rebuild airline, have to buy new planes and need a lot of maintenance.

PIA should need a lot of outsourcing for managing kitchen, maintenance and many more.

Streamlining operations, optimizing flight schedules, and ensuring on-time departures can improve efficiency and customer satisfaction. This includes maintenance of aircraft to prevent delays and cancellations.

Buying new planes can reduce the issue of timetable and departure of flights.

Embrace technology advancements to improve booking systems, enhance in-flight entertainment, and offer more personalized services to passengers.

Investing in effective marketing campaigns and strengthening the brand image can attract more passengers and create positive perceptions in the market.

## **SOLVING PROBLEMS USING 6 SIGMA:**

DMAIC (Define, Measure, Analyze, Improve, Control) is a structured problem-solving methodology used in Six Sigma. Applying DMAIC to PIA (Pakistan International Airlines) can do a lot of improvements.

### **DEFINE:**

First of all in this phase, select one problem to solve. We have accentuated a lot of problems above. Let's consider the issue of number of flights per week and flight delays because they are the main reason that reduces the amount of passengers to travel. Clearly outlines the goals and objectives to solve that issue.

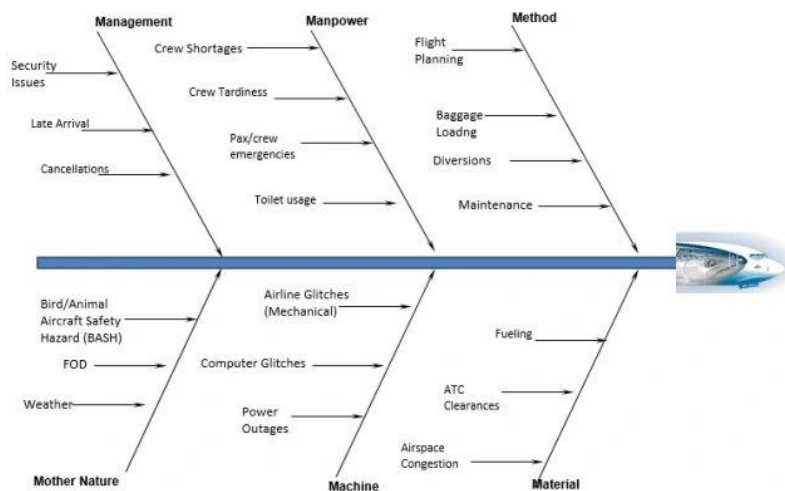
### **MEASURE:**

This phase involves Gathering and analysing relevant data to that issue. In this case, checking the past history of flight delays and problems created by the issue of less number of flights per week.

- **Around 250 flights were canceled between 14 and 22 October, 2023. But the irony is the aviation ministry and PIA administration are mysteriously silent and have no answers to the questions on the crisis.**
- **71 flights of PIA were canceled in one day in 2023, so much uncertainty was not seen even during COVID-19.**
- **The national flag carrier is facing arguably its worst crisis in history as Pakistan State Oil (PSO) has cut the fuel supply over unpaid dues.**

### **ANALYZE:**

This phase involves using mathematical tools and terminologies to analyse the data collected. In this case, if flight delays are an issue, analyze the reasons behind them which may be maintenance issues, scheduling problems, or other factors. Most flight delays occur due to maintenance issue. In past when PIA was banned from Europe, maintenance was the main issue. PIA flew the plane that was out of order first to UK and then to Rome. If the plane was first to go to maintenance, then the reason of next flight cancellation issues arose due to the low number of planes.



### IMPROVE:

This involves developing and implementing solutions based on the analysis. This might involve process improvements, changes in procedures, or introducing new technologies.

In case of flight delays and maintenance issues, the solution that emerges is to buy new planes. But this issue is related to the issue of less budget. Budget can be improved by:

- Getting help from government.
- Reducing the expenses of PIA itself. For example: as mentioned above that PIA has its own printing press department, horticulture department and hospital, it has to reduce those expenses. The medical facilities of working employees and current employees is the duty of government, not the department in which they are serving.

By getting improvement in budget, PIA should:

- Buy new planes and advanced technologies
- Advanced technologies should help to guess some unpredicted conditions such as the exact weather of a week or two so that system should take precautionary measures.

### CONTROL:

This phase involves establishing control mechanisms to monitor the effectiveness of the implemented solutions continuously. Implement checks and balances to ensure that the improvements remain consistent over time.

After getting some improvements, regular audits and feedbacks from passengers should be taken on regular intervals so that any other problem can be improved.



# UNIVERSITY OF SARGODHA

## **Project Title**

BPE : Airlines Management System

Submitted to: SIR SAUD BIN TAHIR

Submitted by: Nimra Iman (BSSE51F21S004)

Syeda Tayyaba Rubab (BSSE51F21S023)



# BPE Airlines Management System Documentation

## Project Title

BPE : Airlines Management System

## Project Purpose

We created a system to help airlines work better. It makes booking flights, managing crews, and helping passengers easier.

### Contents

1. Introduction
2. What We're Doing
3. How It Works
4. What It Does
5. Who Uses It
6. What We Used
7. How We Store Info
8. How It Looks
9. How We Keep It Safe
10. Making Sure It Works

#### 1. Introduction

Our goal is to make airlines better. We made a system that helps with booking flights, managing crews, and making passengers happy.

#### 2. What We're Doing

Our system covers everything airlines need: booking flights, managing crews, helping passengers, and even checking how things are going.

#### 3. How It Works

Airlines in Pakistan including PIA have many flaws therefore we have decided to make a system that is more flexible in its management and everything.

#### 4. What It Does

It helps with booking flights, making sure crews are where they need to be, tracking baggage, checking in passengers, and showing real-time flight updates. There's also a dashboard for airlines to see how things are going.

#### 5. Who Uses It

Different people use the system. Some manage everything, some take care of flights, some help passengers, and some just want to check their flight info.

#### 6. What We Used

We used some tools to build this - like **six sigma**, **DMAIC**, and **MySQL** to store information.

### 7. How We Store Info

We keep information in a smart way using PostgreSQL. It has different tables for flights, bookings, passengers, and crews.

### 8. How It Looks

The system looks nice and is easy to use on computers or phones. We made sure it works well for everyone.

### 9. How We Keep It Safe

We put on a virtual lock and key to keep information safe. Only the right people can access it.

### 10. Making Sure It Works

We tested it a lot to make sure it doesn't have problems. Like checking each part to make sure it does its job.

### 11. Getting It Out There

We put it on the internet so airlines can use it. It's like setting up a shop - now everyone can come and use it.

## Overview

Our system helps airlines be better, which is what the business plan wants. Involves deciding the name, type of planes and other parameters.

## Production

It helps airlines work well by managing crews, saving money, and making sure everything runs smoothly.

## Marketing

Airlines can use our system to make passengers happy and show they're a good choice. This helps them attract more customers.

## Financials

Our system can save airlines money by making things more efficient. This is good for their finances.

## Scalability

Our system can grow with airlines if they get bigger. It's like adding more rooms to a house when the family grows.

Our system is here to make airlines better. It helps with booking flights, managing crews, and making passengers happy. It fits with what airlines want to achieve.

# UNIVERSITY OF SARGODHA

## **Assignment of Entrepreneurship**

Submitted by:

MAHNOOR FATIMA  
(BSSE51F21S011)

Submitted to:

Mr. Badar

**Identified Issue:**

David notices a problem with plastic pollution in oceans and waterways, mostly from single-use plastic bottles.

**Proposed Solution:**

He introduces the "EcoHydrate Bottle," a water bottle made from plant-based materials that break down naturally and can be used in compost.

**Background and Resources:**

David studied environmental science and researched sustainable materials and production methods. He teamed up with a bioengineering company to create the EcoHydrate Bottle and got patents for his technology.

**First mover Advantage:**

Although there are other eco-friendly bottles out there, the EcoHydrate Bottle stands out for being both biodegradable and compostable. People like that David cares about the environment.

**Value created:**

The EcoHydrate Bottle offers a green option to regular plastic bottles, reducing waste and helping the environment.

**Financial Numbers:**

David's company made \$200,000 in sales last year, with a profit of 30%. He wants \$300,000 for a 25% stake to expand marketing and production.

**Further Suggestions:**

The investors like David's idea but worry about costs and growth. They suggest teaming up with beverage companies or stores to reach more people and cut costs. In the end, Kevin O'Leary offers \$300,000 for a 30% stake, promising to help David expand his business smartly.

# UNIVERSITY OF SARGODHA

## **Assignment of Entrepreneurship**

Submitted by:

NIMRA IMAN  
(BSSE51F21S004)

Submitted to:

Mr. Badar

## **Entrepreneurs: Sarah and Jason Thompson**

### **Problem identified:**

Sarah and Jason identify the problem of food waste in households, where a significant amount of food is thrown away due to spoilage or improper storage.

### **Solution or product in return:**

They present their solution, the "FreshSaver Vacuum Sealer," a compact vacuum sealing system that extends the shelf life of perishable foods by removing air and sealing them in airtight bags. Pasteurised food preservation techniques require different temperature for different food products, so these "FreshSaver Vacuum Sealer" take care of it.

### **Knowledge and resources:**

Sarah has a background in culinary arts, and Jason has experience in product design and manufacturing. They have spent years researching food preservation methods and developing prototypes for the FreshSaver Vacuum Sealer.

### **First mover Advantage:**

While vacuum sealers are available on the market, FreshSaver's sleek design and user-friendly features set it apart. Sarah and Jason's focus on simplicity and affordability make their product appealing to a wide range of consumers.

### **Value created:**

The FreshSaver Vacuum Sealer helps households reduce food waste and save money by extending the freshness of perishable items such as fruits, vegetables, and meats.

### **Financial Numbers:**

Sarah and Jason's company has generated \$300,000 in revenue in the past year, with a net profit of 25%. They are seeking a \$500,000 investment in exchange for a 20% equity stake to fund marketing initiatives and expand distribution channels.

### **Any further suggestion:**

The Sharks are impressed by Sarah and Jason's product but express concerns about market saturation and competition from larger appliance manufacturers. They suggest focusing on building brand awareness and loyalty through targeted advertising and social media campaigns. Ultimately, one shark makes an offer, and Sarah and Jason accept a deal for \$500,000 in exchange for a 25% equity stake. Shark agrees to provide funding and guidance to help them scale their business and navigate the competitive landscape in the kitchen appliance industry.

PIA is losing 2 crore PKR per hour nowadays. Made in 1954. PIA was an emerging airline and it was good at start because there is no competitor at that time as there was no airline in gulf. Emirates was made after 1986, ittehat was made in 1990s.

PIA has do zero maintenance of their planes due to low budget, they spend more and earn less. One reason of less earning is:

—> they have just 24 planes. At first they have 48 planes. Among 24, 16 are operational, so that's why planes are less in number

—> other airlines do outsourcing of their maintenance and customer services but in pakistan there is no such facility. Everything is done inhome, that's why they are unable to manage properly.

### **EXCESSIVE STAFF:**

If we just fire the staff of service handling, about 4000 people will be removed from PIA. About 1500 people are for kitchen handling, and in all other countries, these services are outsourced.

Even PIA has its own medical division. There is a general manager, alot of doctors and nurses and other medical staff. This medical staff cover working and retired employees of PIA, although medical facilities are provided by state. At first, they even have diagnostic labs and hospitals where some surgeries also took placed.

PIA has its own printing press and even horticulture center. These employees were first appointed as normal workers but noe they are progressed to become officers in PIA. And the most surprise thing is that all these workers are officially part of PIA employees and they get same facilities as the core employees of PIA get. For kitchen, PIA had its own poultry farm but now it is closed.

We only need supervisors but we are losing a lot of money because we are not doing outsourcing. The employees who are doing core functions are also excessive in number.

### **RISE OF PROBLEMS:**

Actually, problems arises from 1991 when there was an era of Nawaz Sharif. He was inspired by the airport of singapore. Singapore is a city state so they did open sky (means a country can easily operate unlimited flights to and from that state). Nawas sharif announced that we will also do open skying in Karachi. Dubai, singapore, morocco and all other city states required open skying so that alot of passengers come to visit and they earn money from them. But Pakistan is not a city state. So open skying is not good for us. But the good thing is that after facing alot of losses, open skying were stopped.



PIA employees has a bad mentality. The managers consider themselves as commissioners and are not in a condition to compete. Because at first when there was no gulf airlines, there was no competitor but due to emergence of emirates, qatar airlines and tawaqqal, PIA was lost completely.

PIA faced 800 Arab rupee loss and if PIA earn profit for 100 years but still it wouldn't be able to fulfil that loss. Every minister is in the thought to improve PIA just for 2 to 3 months so that he can become a good minister in front of people but no one has made a single attempt to made a long lasting strategy to improve permanently.

If 10 planes can carry only 15 flights they claim that we can carry 40 flights. The code sharing scheme of pia and THY was not accepted by gulf airlines and they stand a huge strike and this scheme was dropped by pia and thy but if it was not dropped pia was able to apply for star airlines.

If this scheme was not dropped pia can bring their flights to Bangkok dhaka and Bengal which can reduce highly gap between PIA and star airlines standard which was a very good step but gulf airlines became a huge unbreakable blockage.

Associations and unions start dictation outside the airport and due to this passengers were unable to go in and out and flights started to stop. This was a huge pressure on PIA so that scheme was dropped.

PELPA pilots association mafia and due to their semi god like behaviour, they don't compromise on duty Timmig more than 10 hours and when time is like 10 to fifteen minutes greater than 10 hours they say we need a break, and PIA have to pay to them. The other thing pia pilots say we can't work more than 30 hours weekly.

PIA faced difficulty in serving the employee, there mafia attitude was a big reason behind downfall. PIA staff manager doesn't even visited their offices as they we in self served palaces their attitude and behavior being as we are God father of PIA we can do what ever we want.

New staff hiring also creates problems due to lack of experience.

Another reason was PIA salaries which was very very low, only 6% of revenue from which 1.25 percent includes pilot salaries and pilots are round about 200-250 of whole PIA staff.

Corruption is one of the most issue that PIA is facing. They demand for the same equipment for 3 to 4 time but they buy only one time and other payments they take by their self.

## RESULT OF SURVEYS:

In 2011, there was a survey from many international passengers. Actually survey mostly covers 10-15% of passengers but this survey cover about 98% of passengers. They are provided with questionnaire and asked why they selected other airlines instead of PIA. Actually these passengers also travelled in PIA for one or two times. The outcome of the survey includes interesting facts because the outcome is that:

- PIA has a very bad service
- number of flights per week is a huge problem
- PIA don't serve alot of destinations. In germany, there are about 5-6 destinations where Pakistanis mostly visit but PIA only covers one to two destinations from it, it means we are losing a lot of passengers.
- many international passengers who are students said that they don't want to travel in PIA because they are not served with alcohol.

## BANS ON PIA:

In 2008, PIA was banned from Europe and it is a very big issue because Europe is a big hub for us. Because of security issues. Civil aviation authority of EU noticed that the plane has a maintenance issue but we neglected that warning and next time again take off that plane to Rome which create serious problem.

## **SOLUTION:**

After 2008, we did nothing but losing money. The criterion of every government is to privatise departments. In recent years, PIA consider to progress by unveiling and printing the news of fake degree scandals. But this is not a solution, you need to rebuild airline, have to buy new planes and need a lot of maintenance.

PIA should need a lot of outsourcing for managing kitchen, maintenance and many more.

Streamlining operations, optimizing flight schedules, and ensuring on-time departures can improve efficiency and customer satisfaction. This includes maintenance of aircraft to prevent delays and cancellations.

Buying new planes can reduce the issue of timetable and departure of flights.

Embrace technology advancements to improve booking systems, enhance in-flight entertainment, and offer more personalized services to passengers.

Investing in effective marketing campaigns and strengthening the brand image can attract more passengers and create positive perceptions in the market.

## **SOLVING PROBLEMS USING 6 SIGMA:**

DMAIC (Define, Measure, Analyze, Improve, Control) is a structured problem-solving methodology used in Six Sigma. Applying DMAIC to PIA (Pakistan International Airlines) can do a lot of improvements.

### **DEFINE:**

First of all in this phase, select one problem to solve. We have accentuated a lot of problems above. Let's consider the issue of number of flights per week and flight delays because they are the main reason that reduces the amount of passengers to travel. Clearly outlines the goals and objectives to solve that issue.

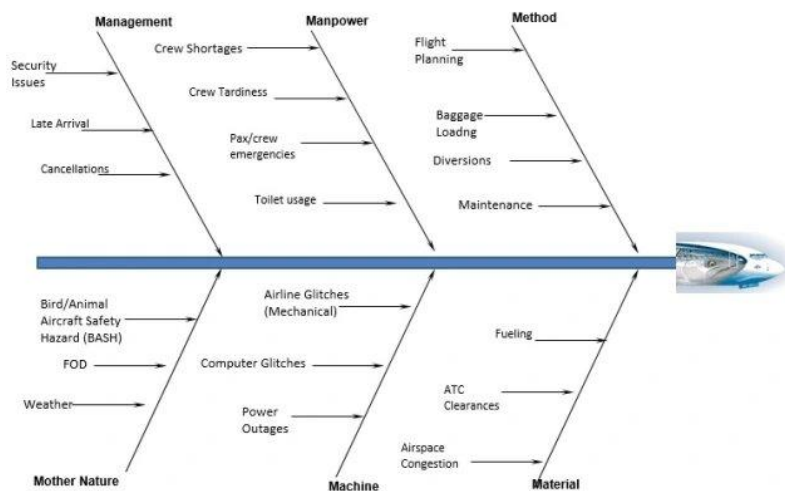
### **MEASURE:**

This phase involves Gathering and analysing relevant data to that issue. In this case, checking the past history of flight delays and problems created by the issue of less number of flights per week.

- **Around 250 flights were canceled between 14 and 22 October, 2023. But the irony is the aviation ministry and PIA administration are mysteriously silent and have no answers to the questions on the crisis.**
- **71 flights of PIA were canceled in one day in 2023, so much uncertainty was not seen even during COVID-19.**
- **The national flag carrier is facing arguably its worst crisis in history as Pakistan State Oil (PSO) has cut the fuel supply over unpaid dues.**

### **ANALYZE:**

This phase involves using mathematical tools and terminologies to analyse the data collected. In this case, if flight delays are an issue, analyze the reasons behind them which may be maintenance issues, scheduling problems, or other factors. Most flight delays occur due to maintenance issue. In past when PIA was banned from Europe, maintenance was the main issue. PIA flew the plane that was out of order first to UK and then to Rome. If the plane was first to go to maintenance, then the reason of next flight cancellation issues arose due to the low number of planes.



### IMPROVE:

This involves developing and implementing solutions based on the analysis. This might involve process improvements, changes in procedures, or introducing new technologies.

In case of flight delays and maintenance issues, the solution that emerges is to buy new planes. But this issue is related to the issue of less budget. Budget can be improved by:

- Getting help from government.
- Reducing the expenses of PIA itself. For example: as mentioned above that PIA has its own printing press department, horticulture department and hospital, it has to reduce those expenses. The medical facilities of working employees and current employees is the duty of government, not the department in which they are serving.

By getting improvement in budget, PIA should:

- Buy new planes and advanced technologies
- Advanced technologies should help to guess some unpredicted conditions such as the exact weather of a week or two so that system should take precautionary measures.

### CONTROL:

This phase involves establishing control mechanisms to monitor the effectiveness of the implemented solutions continuously. Implement checks and balances to ensure that the improvements remain consistent over time.

After getting some improvements, regular audits and feedbacks from passengers should be taken on regular intervals so that any other problem can be improved.



# UNIVERSITY OF SARGODHA

## **Project Title**

BPE : Airlines Management System

Submitted to: SIR SAUD BIN TAHIR

Submitted by: Nimra Iman (BSSE51F21S004)

Syeda Tayyaba Rubab (BSSE51F21S023)

# BPE Airlines Management System Documentation

## Project Title

BPE : Airlines Management System

## Project Purpose

We created a system to help airlines work better. It makes booking flights, managing crews, and helping passengers easier.

### Contents

1. Introduction
2. What We're Doing
3. How It Works
4. What It Does
5. Who Uses It
6. What We Used
7. How We Store Info
8. How It Looks
9. How We Keep It Safe
10. Making Sure It Works

#### 1. Introduction

Our goal is to make airlines better. We made a system that helps with booking flights, managing crews, and making passengers happy.

#### 2. What We're Doing

Our system covers everything airlines need: booking flights, managing crews, helping passengers, and even checking how things are going.

#### 3. How It Works

Airlines in Pakistan including PIA have many flaws therefore we have decided to make a system that is more flexible in its management and everything.

#### 4. What It Does

It helps with booking flights, making sure crews are where they need to be, tracking baggage, checking in passengers, and showing real-time flight updates. There's also a dashboard for airlines to see how things are going.

#### 5. Who Uses It

Different people use the system. Some manage everything, some take care of flights, some help passengers, and some just want to check their flight info.

#### 6. What We Used

We used some tools to build this - like **six sigma**, **DMAIC**, and **MySQL** to store information.

### 7. How We Store Info

We keep information in a smart way using PostgreSQL. It has different tables for flights, bookings, passengers, and crews.

### 8. How It Looks

The system looks nice and is easy to use on computers or phones. We made sure it works well for everyone.

### 9. How We Keep It Safe

We put on a virtual lock and key to keep information safe. Only the right people can access it.

### 10. Making Sure It Works

We tested it a lot to make sure it doesn't have problems. Like checking each part to make sure it does its job.

### 11. Getting It Out There

We put it on the internet so airlines can use it. It's like setting up a shop - now everyone can come and use it.

## Overview

Our system helps airlines be better, which is what the business plan wants. Involves deciding the name, type of planes and other parameters.

## Production

It helps airlines work well by managing crews, saving money, and making sure everything runs smoothly.

## Marketing

Airlines can use our system to make passengers happy and show they're a good choice. This helps them attract more customers.

## Financials

Our system can save airlines money by making things more efficient. This is good for their finances.

## Scalability

Our system can grow with airlines if they get bigger. It's like adding more rooms to a house when the family grows.

Our system is here to make airlines better. It helps with booking flights, managing crews, and making passengers happy. It fits with what airlines want to achieve.



# UNIVERSITY OF SARGODHA

## **Assignment of Entrepreneurship**

Submitted by:

MAHNOOR FATIMA  
(BSSE51F21S011)

Submitted to:

Mr. Badar

**Identified Issue:**

David notices a problem with plastic pollution in oceans and waterways, mostly from single-use plastic bottles.

**Proposed Solution:**

He introduces the "EcoHydrate Bottle," a water bottle made from plant-based materials that break down naturally and can be used in compost.

**Background and Resources:**

David studied environmental science and researched sustainable materials and production methods. He teamed up with a bioengineering company to create the EcoHydrate Bottle and got patents for his technology.

**First mover Advantage:**

Although there are other eco-friendly bottles out there, the EcoHydrate Bottle stands out for being both biodegradable and compostable. People like that David cares about the environment.

**Value created:**

The EcoHydrate Bottle offers a green option to regular plastic bottles, reducing waste and helping the environment.

**Financial Numbers:**

David's company made \$200,000 in sales last year, with a profit of 30%. He wants \$300,000 for a 25% stake to expand marketing and production.

**Further Suggestions:**

The investors like David's idea but worry about costs and growth. They suggest teaming up with beverage companies or stores to reach more people and cut costs. In the end, Kevin O'Leary offers \$300,000 for a 30% stake, promising to help David expand his business smartly.

# UNIVERSITY OF SARGODHA

## **Assignment of Entrepreneurship**

Submitted by:

NIMRA IMAN  
(BSSE51F21S004)

Submitted to:

Mr. Badar

## **Entrepreneurs: Sarah and Jason Thompson**

### **Problem identified:**

Sarah and Jason identify the problem of food waste in households, where a significant amount of food is thrown away due to spoilage or improper storage.

### **Solution or product in return:**

They present their solution, the "FreshSaver Vacuum Sealer," a compact vacuum sealing system that extends the shelf life of perishable foods by removing air and sealing them in airtight bags. Pasteurised food preservation techniques require different temperature for different food products, so these "FreshSaver Vacuum Sealer" take care of it.

### **Knowledge and resources:**

Sarah has a background in culinary arts, and Jason has experience in product design and manufacturing. They have spent years researching food preservation methods and developing prototypes for the FreshSaver Vacuum Sealer.

### **First mover Advantage:**

While vacuum sealers are available on the market, FreshSaver's sleek design and user-friendly features set it apart. Sarah and Jason's focus on simplicity and affordability make their product appealing to a wide range of consumers.

### **Value created:**

The FreshSaver Vacuum Sealer helps households reduce food waste and save money by extending the freshness of perishable items such as fruits, vegetables, and meats.

### **Financial Numbers:**

Sarah and Jason's company has generated \$300,000 in revenue in the past year, with a net profit of 25%. They are seeking a \$500,000 investment in exchange for a 20% equity stake to fund marketing initiatives and expand distribution channels.

### **Any further suggestion:**

The Sharks are impressed by Sarah and Jason's product but express concerns about market saturation and competition from larger appliance manufacturers. They suggest focusing on building brand awareness and loyalty through targeted advertising and social media campaigns. Ultimately, one shark makes an offer, and Sarah and Jason accept a deal for \$500,000 in exchange for a 25% equity stake. Shark agrees to provide funding and guidance to help them scale their business and navigate the competitive landscape in the kitchen appliance industry.

PIA is losing 2 crore PKR per hour nowadays. Made in 1954. PIA was an emerging airline and it was good at start because there is no competitor at that time as there was no airline in gulf. Emirates was made after 1986, ittehat was made in 1990s.

PIA has do zero maintenance of their planes due to low budget, they spend more and earn less. One reason of less earning is:

—> they have just 24 planes. At first they have 48 planes. Among 24, 16 are operational, so that's why planes are less in number

—> other airlines do outsourcing of their maintenance and customer services but in pakistan there is no such facility. Everything is done inhome, that's why they are unable to manage properly.

### **EXCESSIVE STAFF:**

If we just fire the staff of service handling, about 4000 people will be removed from PIA. About 1500 people are for kitchen handling, and in all other countries, these services are outsourced.

Even PIA has its own medical division. There is a general manager, alot of doctors and nurses and other medical staff. This medical staff cover working and retired employees of PIA, although medical facilities are provided by state. At first, they even have diagnostic labs and hospitals where some surgeries also took placed.

PIA has its own printing press and even horticulture center. These employees were first appointed as normal workers but noe they are progressed to become officers in PIA. And the most surprise thing is that all these workers are officially part of PIA employees and they get same facilities as the core employees of PIA get. For kitchen, PIA had its own poultry farm but now it is closed.

We only need supervisors but we are losing a lot of money because we are not doing outsourcing. The employees who are doing core functions are also excessive in number.

### **RISE OF PROBLEMS:**

Actually, problems arises from 1991 when there was an era of Nawaz Sharif. He was inspired by the airport of singapore. Singapore is a city state so they did open sky (means a country can easily operate unlimited flights to and from that state). Nawas sharif announced that we will also do open skying in Karachi. Dubai, singapore, morocco and all other city states required open skying so that alot of passengers come to visit and they earn money from them. But Pakistan is not a city state. So open skying is not good for us. But the good thing is that after facing alot of losses, open skying were stopped.

PIA employees has a bad mentality. The managers consider themselves as commissioners and are not in a condition to compete. Because at first when there was no gulf airlines, there was no competitor but due to emergence of emirates, qatar airlines and tawaqqal, PIA was lost completely.

PIA faced 800 Arab rupee loss and if PIA earn profit for 100 years but still it wouldn't be able to fulfil that loss. Every minister is in the thought to improve PIA just for 2 to 3 months so that he can become a good minister in front of people but no one has made a single attempt to made a long lasting strategy to improve permanently.

If 10 planes can carry only 15 flights they claim that we can carry 40 flights. The code sharing scheme of pia and THY was not accepted by gulf airlines and they stand a huge strike and this scheme was dropped by pia and thy but if it was not dropped pia was able to apply for star airlines.

If this scheme was not dropped pia can bring their flights to Bangkok dhaka and Bengal which can reduce highly gap between PIA and star airlines standard which was a very good step but gulf airlines became a huge unbreakable blockage.

Associations and unions start dictation outside the airport and due to this passengers were unable to go in and out and flights started to stop. This was a huge pressure on PIA so that scheme was dropped.

PELPA pilots association mafia and due to their semi god like behaviour, they don't compromise on duty Timmig more than 10 hours and when time is like 10 to fifteen minutes greater than 10 hours they say we need a break, and PIA have to pay to them. The other thing pia pilots say we can't work more than 30 hours weekly.

PIA faced difficulty in serving the employee, there mafia attitude was a big reason behind downfall. PIA staff manager doesn't even visited their offices as they we in self served palaces their attitude and behavior being as we are God father of PIA we can do what ever we want.

New staff hiring also creates problems due to lack of experience.

Another reason was PIA salaries which was very very low, only 6% of revenue from which 1.25 percent includes pilot salaries and pilots are round about 200-250 of whole PIA staff.

Corruption is one of the most issue that PIA is facing. They demand for the same equipment for 3 to 4 time but they buy only one time and other payments they take by their self.

## RESULT OF SURVEYS:

In 2011, there was a survey from many international passengers. Actually survey mostly covers 10-15% of passengers but this survey cover about 98% of passengers. They are provided with questionnaire and asked why they selected other airlines instead of PIA. Actually these passengers also travelled in PIA for one or two times. The outcome of the survey includes interesting facts because the outcome is that:

- PIA has a very bad service
- number of flights per week is a huge problem
- PIA don't serve alot of destinations. In germany, there are about 5-6 destinations where Pakistanis mostly visit but PIA only covers one to two destinations from it, it means we are losing a lot of passengers.
- many international passengers who are students said that they don't want to travel in PIA because they are not served with alcohol.

## BANS ON PIA:

In 2008, PIA was banned from Europe and it is a very big issue because Europe is a big hub for us. Because of security issues. Civil aviation authority of EU noticed that the plane has a maintenance issue but we neglected that warning and next time again take off that plane to Rome which create serious problem.

## **SOLUTION:**

After 2008, we did nothing but losing money. The criterion of every government is to privatise departments. In recent years, PIA consider to progress by unveiling and printing the news of fake degree scandals. But this is not a solution, you need to rebuild airline, have to buy new planes and need a lot of maintenance.

PIA should need a lot of outsourcing for managing kitchen, maintenance and many more.

Streamlining operations, optimizing flight schedules, and ensuring on-time departures can improve efficiency and customer satisfaction. This includes maintenance of aircraft to prevent delays and cancellations.

Buying new planes can reduce the issue of timetable and departure of flights.

Embrace technology advancements to improve booking systems, enhance in-flight entertainment, and offer more personalized services to passengers.

Investing in effective marketing campaigns and strengthening the brand image can attract more passengers and create positive perceptions in the market.

## **SOLVING PROBLEMS USING 6 SIGMA:**

DMAIC (Define, Measure, Analyze, Improve, Control) is a structured problem-solving methodology used in Six Sigma. Applying DMAIC to PIA (Pakistan International Airlines) can do a lot of improvements.

### **DEFINE:**

First of all in this phase, select one problem to solve. We have accentuated a lot of problems above. Let's consider the issue of number of flights per week and flight delays because they are the main reason that reduces the amount of passengers to travel. Clearly outlines the goals and objectives to solve that issue.

### **MEASURE:**

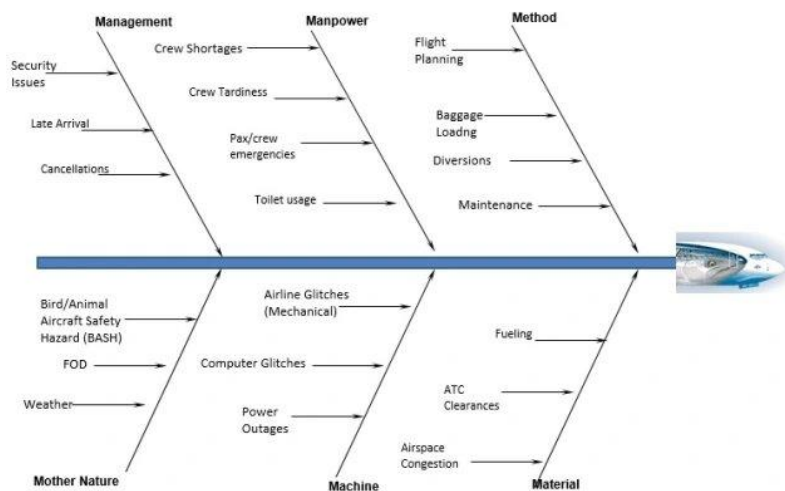
This phase involves Gathering and analysing relevant data to that issue. In this case, checking the past history of flight delays and problems created by the issue of less number of flights per week.

- **Around 250 flights were canceled between 14 and 22 October, 2023. But the irony is the aviation ministry and PIA administration are mysteriously silent and have no answers to the questions on the crisis.**
- **71 flights of PIA were canceled in one day in 2023, so much uncertainty was not seen even during COVID-19.**
- **The national flag carrier is facing arguably its worst crisis in history as Pakistan State Oil (PSO) has cut the fuel supply over unpaid dues.**

### **ANALYZE:**

This phase involves using mathematical tools and terminologies to analyse the data collected. In this case, if flight delays are an issue, analyze the reasons behind them which may be maintenance issues, scheduling problems, or other factors. Most flight delays occur due to maintenance issue. In past when PIA was banned from Europe, maintenance was the main issue. PIA flew the plane that was out of order first to UK and then to Rome. If the plane was first to go to maintenance, then the reason of next flight cancellation issues arose due to the low number of planes.





### IMPROVE:

This involves developing and implementing solutions based on the analysis. This might involve process improvements, changes in procedures, or introducing new technologies.

In case of flight delays and maintenance issues, the solution that emerges is to buy new planes. But this issue is related to the issue of less budget. Budget can be improved by:

- Getting help from government.
- Reducing the expenses of PIA itself. For example: as mentioned above that PIA has its own printing press department, horticulture department and hospital, it has to reduce those expenses. The medical facilities of working employees and current employees is the duty of government, not the department in which they are serving.

By getting improvement in budget, PIA should:

- Buy new planes and advanced technologies
- Advanced technologies should help to guess some unpredicted conditions such as the exact weather of a week or two so that system should take precautionary measures.

### CONTROL:

This phase involves establishing control mechanisms to monitor the effectiveness of the implemented solutions continuously. Implement checks and balances to ensure that the improvements remain consistent over time.

After getting some improvements, regular audits and feedbacks from passengers should be taken on regular intervals so that any other problem can be improved.



# UNIVERSITY OF SARGODHA

## **Project Title**

BPE : Airlines Management System

Submitted to: SIR SAUD BIN TAHIR

Submitted by: Nimra Iman (BSSE51F21S004)

Syeda Tayyaba Rubab (BSSE51F21S023)

# BPE Airlines Management System Documentation

## Project Title

BPE : Airlines Management System

## Project Purpose

We created a system to help airlines work better. It makes booking flights, managing crews, and helping passengers easier.

### Contents

1. Introduction
2. What We're Doing
3. How It Works
4. What It Does
5. Who Uses It
6. What We Used
7. How We Store Info
8. How It Looks
9. How We Keep It Safe
10. Making Sure It Works

#### 1. Introduction

Our goal is to make airlines better. We made a system that helps with booking flights, managing crews, and making passengers happy.

#### 2. What We're Doing

Our system covers everything airlines need: booking flights, managing crews, helping passengers, and even checking how things are going.

#### 3. How It Works

Airlines in Pakistan including PIA have many flaws therefore we have decided to make a system that is more flexible in its management and everything.

#### 4. What It Does

It helps with booking flights, making sure crews are where they need to be, tracking baggage, checking in passengers, and showing real-time flight updates. There's also a dashboard for airlines to see how things are going.

#### 5. Who Uses It

Different people use the system. Some manage everything, some take care of flights, some help passengers, and some just want to check their flight info.

#### 6. What We Used

We used some tools to build this - like **six sigma**, **DMAIC**, and **MySQL** to store information.

### 7. How We Store Info

We keep information in a smart way using PostgreSQL. It has different tables for flights, bookings, passengers, and crews.

### 8. How It Looks

The system looks nice and is easy to use on computers or phones. We made sure it works well for everyone.

### 9. How We Keep It Safe

We put on a virtual lock and key to keep information safe. Only the right people can access it.

### 10. Making Sure It Works

We tested it a lot to make sure it doesn't have problems. Like checking each part to make sure it does its job.

### 11. Getting It Out There

We put it on the internet so airlines can use it. It's like setting up a shop - now everyone can come and use it.

## Overview

Our system helps airlines be better, which is what the business plan wants. Involves deciding the name, type of planes and other parameters.

## Production

It helps airlines work well by managing crews, saving money, and making sure everything runs smoothly.

## Marketing

Airlines can use our system to make passengers happy and show they're a good choice. This helps them attract more customers.

## Financials

Our system can save airlines money by making things more efficient. This is good for their finances.

## Scalability

Our system can grow with airlines if they get bigger. It's like adding more rooms to a house when the family grows.

Our system is here to make airlines better. It helps with booking flights, managing crews, and making passengers happy. It fits with what airlines want to achieve.

# UNIVERSITY OF SARGODHA

## **Assignment of Entrepreneurship**

Submitted by:

MAHNOOR FATIMA  
(BSSE51F21S011)

Submitted to:

Mr. Badar

**Identified Issue:**

David notices a problem with plastic pollution in oceans and waterways, mostly from single-use plastic bottles.

**Proposed Solution:**

He introduces the "EcoHydrate Bottle," a water bottle made from plant-based materials that break down naturally and can be used in compost.

**Background and Resources:**

David studied environmental science and researched sustainable materials and production methods. He teamed up with a bioengineering company to create the EcoHydrate Bottle and got patents for his technology.

**First mover Advantage:**

Although there are other eco-friendly bottles out there, the EcoHydrate Bottle stands out for being both biodegradable and compostable. People like that David cares about the environment.

**Value created:**

The EcoHydrate Bottle offers a green option to regular plastic bottles, reducing waste and helping the environment.

**Financial Numbers:**

David's company made \$200,000 in sales last year, with a profit of 30%. He wants \$300,000 for a 25% stake to expand marketing and production.

**Further Suggestions:**

The investors like David's idea but worry about costs and growth. They suggest teaming up with beverage companies or stores to reach more people and cut costs. In the end, Kevin O'Leary offers \$300,000 for a 30% stake, promising to help David expand his business smartly.

# UNIVERSITY OF SARGODHA

## **Assignment of Entrepreneurship**

Submitted by:

NIMRA IMAN  
(BSSE51F21S004)

Submitted to:

Mr. Badar



## **Entrepreneurs: Sarah and Jason Thompson**

### **Problem identified:**

Sarah and Jason identify the problem of food waste in households, where a significant amount of food is thrown away due to spoilage or improper storage.

### **Solution or product in return:**

They present their solution, the "FreshSaver Vacuum Sealer," a compact vacuum sealing system that extends the shelf life of perishable foods by removing air and sealing them in airtight bags. Pasteurised food preservation techniques require different temperature for different food products, so these "FreshSaver Vacuum Sealer" take care of it.

### **Knowledge and resources:**

Sarah has a background in culinary arts, and Jason has experience in product design and manufacturing. They have spent years researching food preservation methods and developing prototypes for the FreshSaver Vacuum Sealer.

### **First mover Advantage:**

While vacuum sealers are available on the market, FreshSaver's sleek design and user-friendly features set it apart. Sarah and Jason's focus on simplicity and affordability make their product appealing to a wide range of consumers.

### **Value created:**

The FreshSaver Vacuum Sealer helps households reduce food waste and save money by extending the freshness of perishable items such as fruits, vegetables, and meats.

### **Financial Numbers:**

Sarah and Jason's company has generated \$300,000 in revenue in the past year, with a net profit of 25%. They are seeking a \$500,000 investment in exchange for a 20% equity stake to fund marketing initiatives and expand distribution channels.

### **Any further suggestion:**

The Sharks are impressed by Sarah and Jason's product but express concerns about market saturation and competition from larger appliance manufacturers. They suggest focusing on building brand awareness and loyalty through targeted advertising and social media campaigns. Ultimately, one shark makes an offer, and Sarah and Jason accept a deal for \$500,000 in exchange for a 25% equity stake. Shark agrees to provide funding and guidance to help them scale their business and navigate the competitive landscape in the kitchen appliance industry.

PIA is losing 2 crore PKR per hour nowadays. Made in 1954. PIA was an emerging airline and it was good at start because there is no competitor at that time as there was no airline in gulf. Emirates was made after 1986, ittehat was made in 1990s.

PIA has do zero maintenance of their planes due to low budget, they spend more and earn less. One reason of less earning is:

—> they have just 24 planes. At first they have 48 planes. Among 24, 16 are operational, so that's why planes are less in number

—> other airlines do outsourcing of their maintenance and customer services but in pakistan there is no such facility. Everything is done inhome, that's why they are unable to manage properly.

### **EXCESSIVE STAFF:**

If we just fire the staff of service handling, about 4000 people will be removed from PIA. About 1500 people are for kitchen handling, and in all other countries, these services are outsourced.

Even PIA has its own medical division. There is a general manager, alot of doctors and nurses and other medical staff. This medical staff cover working and retired employees of PIA, although medical facilities are provided by state. At first, they even have diagnostic labs and hospitals where some surgeries also took placed.

PIA has its own printing press and even horticulture center. These employees were first appointed as normal workers but noe they are progressed to become officers in PIA. And the most surprise thing is that all these workers are officially part of PIA employees and they get same facilities as the core employees of PIA get. For kitchen, PIA had its own poultry farm but now it is closed.

We only need supervisors but we are losing a lot of money because we are not doing outsourcing. The employees who are doing core functions are also excessive in number.

### **RISE OF PROBLEMS:**

Actually, problems arises from 1991 when there was an era of Nawaz Sharif. He was inspired by the airport of singapore. Singapore is a city state so they did open sky (means a country can easily operate unlimited flights to and from that state). Nawas sharif announced that we will also do open skying in Karachi. Dubai, singapore, morocco and all other city states required open skying so that alot of passengers come to visit and they earn money from them. But Pakistan is not a city state. So open skying is not good for us. But the good thing is that after facing alot of losses, open skying were stopped.

PIA employees has a bad mentality. The managers consider themselves as commissioners and are not in a condition to compete. Because at first when there was no gulf airlines, there was no competitor but due to emergence of emirates, qatar airlines and tawaqqal, PIA was lost completely.

PIA faced 800 Arab rupee loss and if PIA earn profit for 100 years but still it wouldn't be able to fulfil that loss. Every minister is in the thought to improve PIA just for 2 to 3 months so that he can become a good minister in front of people but no one has made a single attempt to made a long lasting strategy to improve permanently.

If 10 planes can carry only 15 flights they claim that we can carry 40 flights. The code sharing scheme of pia and THY was not accepted by gulf airlines and they stand a huge strike and this scheme was dropped by pia and thy but if it was not dropped pia was able to apply for star airlines.

If this scheme was not dropped pia can bring their flights to Bangkok dhaka and Bengal which can reduce highly gap between PIA and star airlines standard which was a very good step but gulf airlines became a huge unbreakable blockage.

Associations and unions start dictation outside the airport and due to this passengers were unable to go in and out and flights started to stop. This was a huge pressure on PIA so that scheme was dropped.

PELPA pilots association mafia and due to their semi god like behaviour, they don't compromise on duty Timmig more than 10 hours and when time is like 10 to fifteen minutes greater than 10 hours they say we need a break, and PIA have to pay to them. The other thing pia pilots say we can't work more than 30 hours weekly.

PIA faced difficulty in serving the employee, there mafia attitude was a big reason behind downfall. PIA staff manager doesn't even visited their offices as they we in self served palaces their attitude and behavior being as we are God father of PIA we can do what ever we want.

New staff hiring also creates problems due to lack of experience.

Another reason was PIA salaries which was very very low, only 6% of revenue from which 1.25 percent includes pilot salaries and pilots are round about 200-250 of whole PIA staff.

Corruption is one of the most issue that PIA is facing. They demand for the same equipment for 3 to 4 time but they buy only one time and other payments they take by their self.

## RESULT OF SURVEYS:

In 2011, there was a survey from many international passengers. Actually survey mostly covers 10-15% of passengers but this survey cover about 98% of passengers. They are provided with questionnaire and asked why they selected other airlines instead of PIA. Actually these passengers also travelled in PIA for one or two times. The outcome of the survey includes interesting facts because the outcome is that:

- PIA has a very bad service
- number of flights per week is a huge problem
- PIA don't serve alot of destinations. In germany, there are about 5-6 destinations where Pakistanis mostly visit but PIA only covers one to two destinations from it, it means we are losing a lot of passengers.
- many international passengers who are students said that they don't want to travel in PIA because they are not served with alcohol.

## BANS ON PIA:

In 2008, PIA was banned from Europe and it is a very big issue because Europe is a big hub for us. Because of security issues. Civil aviation authority of EU noticed that the plane has a maintenance issue but we neglected that warning and next time again take off that plane to Rome which create serious problem.

## **SOLUTION:**

After 2008, we did nothing but losing money. The criterion of every government is to privatise departments. In recent years, PIA consider to progress by unveiling and printing the news of fake degree scandals. But this is not a solution, you need to rebuild airline, have to buy new planes and need a lot of maintenance.

PIA should need a lot of outsourcing for managing kitchen, maintenance and many more.

Streamlining operations, optimizing flight schedules, and ensuring on-time departures can improve efficiency and customer satisfaction. This includes maintenance of aircraft to prevent delays and cancellations.

Buying new planes can reduce the issue of timetable and departure of flights.

Embrace technology advancements to improve booking systems, enhance in-flight entertainment, and offer more personalized services to passengers.

Investing in effective marketing campaigns and strengthening the brand image can attract more passengers and create positive perceptions in the market.

## **SOLVING PROBLEMS USING 6 SIGMA:**

DMAIC (Define, Measure, Analyze, Improve, Control) is a structured problem-solving methodology used in Six Sigma. Applying DMAIC to PIA (Pakistan International Airlines) can do a lot of improvements.

### **DEFINE:**

First of all in this phase, select one problem to solve. We have accentuated a lot of problems above. Let's consider the issue of number of flights per week and flight delays because they are the main reason that reduces the amount of passengers to travel. Clearly outlines the goals and objectives to solve that issue.

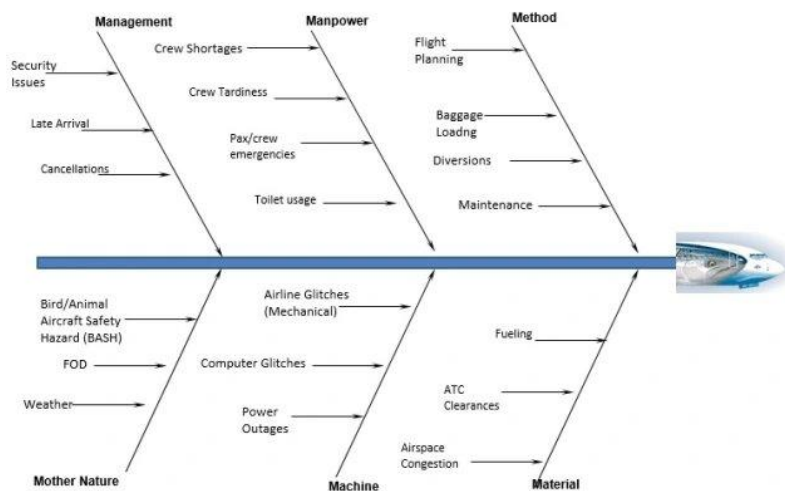
### **MEASURE:**

This phase involves Gathering and analysing relevant data to that issue. In this case, checking the past history of flight delays and problems created by the issue of less number of flights per week.

- **Around 250 flights were canceled between 14 and 22 October, 2023. But the irony is the aviation ministry and PIA administration are mysteriously silent and have no answers to the questions on the crisis.**
- **71 flights of PIA were canceled in one day in 2023, so much uncertainty was not seen even during COVID-19.**
- **The national flag carrier is facing arguably its worst crisis in history as Pakistan State Oil (PSO) has cut the fuel supply over unpaid dues.**

### **ANALYZE:**

This phase involves using mathematical tools and terminologies to analyse the data collected. In this case, if flight delays are an issue, analyze the reasons behind them which may be maintenance issues, scheduling problems, or other factors. Most flight delays occur due to maintenance issue. In past when PIA was banned from Europe, maintenance was the main issue. PIA flew the plane that was out of order first to UK and then to Rome. If the plane was first to go to maintenance, then the reason of next flight cancellation issues arose due to the low number of planes.



### IMPROVE:

This involves developing and implementing solutions based on the analysis. This might involve process improvements, changes in procedures, or introducing new technologies.

In case of flight delays and maintenance issues, the solution that emerges is to buy new planes. But this issue is related to the issue of less budget. Budget can be improved by:

- Getting help from government.
- Reducing the expenses of PIA itself. For example: as mentioned above that PIA has its own printing press department, horticulture department and hospital, it has to reduce those expenses. The medical facilities of working employees and current employees is the duty of government, not the department in which they are serving.

By getting improvement in budget, PIA should:

- Buy new planes and advanced technologies
- Advanced technologies should help to guess some unpredicted conditions such as the exact weather of a week or two so that system should take precautionary measures.

### CONTROL:

This phase involves establishing control mechanisms to monitor the effectiveness of the implemented solutions continuously. Implement checks and balances to ensure that the improvements remain consistent over time.

After getting some improvements, regular audits and feedbacks from passengers should be taken on regular intervals so that any other problem can be improved.



# UNIVERSITY OF SARGODHA

## **Project Title**

BPE : Airlines Management System

Submitted to: SIR SAUD BIN TAHIR

Submitted by: Nimra Iman (BSSE51F21S004)

Syeda Tayyaba Rubab (BSSE51F21S023)

# BPE Airlines Management System Documentation

## Project Title

BPE : Airlines Management System

## Project Purpose

We created a system to help airlines work better. It makes booking flights, managing crews, and helping passengers easier.

### Contents

1. Introduction
2. What We're Doing
3. How It Works
4. What It Does
5. Who Uses It
6. What We Used
7. How We Store Info
8. How It Looks
9. How We Keep It Safe
10. Making Sure It Works

#### 1. Introduction

Our goal is to make airlines better. We made a system that helps with booking flights, managing crews, and making passengers happy.

#### 2. What We're Doing

Our system covers everything airlines need: booking flights, managing crews, helping passengers, and even checking how things are going.

#### 3. How It Works

Airlines in Pakistan including PIA have many flaws therefore we have decided to make a system that is more flexible in its management and everything.

#### 4. What It Does

It helps with booking flights, making sure crews are where they need to be, tracking baggage, checking in passengers, and showing real-time flight updates. There's also a dashboard for airlines to see how things are going.

#### 5. Who Uses It

Different people use the system. Some manage everything, some take care of flights, some help passengers, and some just want to check their flight info.

#### 6. What We Used

We used some tools to build this - like **six sigma**, **DMAIC**, and **MySQL** to store information.



### 7. How We Store Info

We keep information in a smart way using PostgreSQL. It has different tables for flights, bookings, passengers, and crews.

### 8. How It Looks

The system looks nice and is easy to use on computers or phones. We made sure it works well for everyone.

### 9. How We Keep It Safe

We put on a virtual lock and key to keep information safe. Only the right people can access it.

### 10. Making Sure It Works

We tested it a lot to make sure it doesn't have problems. Like checking each part to make sure it does its job.

### 11. Getting It Out There

We put it on the internet so airlines can use it. It's like setting up a shop - now everyone can come and use it.

## Overview

Our system helps airlines be better, which is what the business plan wants. Involves deciding the name, type of planes and other parameters.

## Production

It helps airlines work well by managing crews, saving money, and making sure everything runs smoothly.

## Marketing

Airlines can use our system to make passengers happy and show they're a good choice. This helps them attract more customers.

## Financials

Our system can save airlines money by making things more efficient. This is good for their finances.

## Scalability

Our system can grow with airlines if they get bigger. It's like adding more rooms to a house when the family grows.

Our system is here to make airlines better. It helps with booking flights, managing crews, and making passengers happy. It fits with what airlines want to achieve.

# UNIVERSITY OF SARGODHA

## **Assignment of Entrepreneurship**

Submitted by:

MAHNOOR FATIMA  
(BSSE51F21S011)

Submitted to:

Mr. Badar

**Identified Issue:**

David notices a problem with plastic pollution in oceans and waterways, mostly from single-use plastic bottles.

**Proposed Solution:**

He introduces the "EcoHydrate Bottle," a water bottle made from plant-based materials that break down naturally and can be used in compost.

**Background and Resources:**

David studied environmental science and researched sustainable materials and production methods. He teamed up with a bioengineering company to create the EcoHydrate Bottle and got patents for his technology.

**First mover Advantage:**

Although there are other eco-friendly bottles out there, the EcoHydrate Bottle stands out for being both biodegradable and compostable. People like that David cares about the environment.

**Value created:**

The EcoHydrate Bottle offers a green option to regular plastic bottles, reducing waste and helping the environment.

**Financial Numbers:**

David's company made \$200,000 in sales last year, with a profit of 30%. He wants \$300,000 for a 25% stake to expand marketing and production.

**Further Suggestions:**

The investors like David's idea but worry about costs and growth. They suggest teaming up with beverage companies or stores to reach more people and cut costs. In the end, Kevin O'Leary offers \$300,000 for a 30% stake, promising to help David expand his business smartly.

# UNIVERSITY OF SARGODHA

## **Assignment of Entrepreneurship**

Submitted by:

NIMRA IMAN  
(BSSE51F21S004)

Submitted to:

Mr. Badar

## **Entrepreneurs: Sarah and Jason Thompson**

### **Problem identified:**

Sarah and Jason identify the problem of food waste in households, where a significant amount of food is thrown away due to spoilage or improper storage.

### **Solution or product in return:**

They present their solution, the "FreshSaver Vacuum Sealer," a compact vacuum sealing system that extends the shelf life of perishable foods by removing air and sealing them in airtight bags. Pasteurised food preservation techniques require different temperature for different food products, so these "FreshSaver Vacuum Sealer" take care of it.

### **Knowledge and resources:**

Sarah has a background in culinary arts, and Jason has experience in product design and manufacturing. They have spent years researching food preservation methods and developing prototypes for the FreshSaver Vacuum Sealer.

### **First mover Advantage:**

While vacuum sealers are available on the market, FreshSaver's sleek design and user-friendly features set it apart. Sarah and Jason's focus on simplicity and affordability make their product appealing to a wide range of consumers.

### **Value created:**

The FreshSaver Vacuum Sealer helps households reduce food waste and save money by extending the freshness of perishable items such as fruits, vegetables, and meats.

### **Financial Numbers:**

Sarah and Jason's company has generated \$300,000 in revenue in the past year, with a net profit of 25%. They are seeking a \$500,000 investment in exchange for a 20% equity stake to fund marketing initiatives and expand distribution channels.

### **Any further suggestion:**

The Sharks are impressed by Sarah and Jason's product but express concerns about market saturation and competition from larger appliance manufacturers. They suggest focusing on building brand awareness and loyalty through targeted advertising and social media campaigns. Ultimately, one shark makes an offer, and Sarah and Jason accept a deal for \$500,000 in exchange for a 25% equity stake. Shark agrees to provide funding and guidance to help them scale their business and navigate the competitive landscape in the kitchen appliance industry.

PIA is losing 2 crore PKR per hour nowadays. Made in 1954. PIA was an emerging airline and it was good at start because there is no competitor at that time as there was no airline in gulf. Emirates was made after 1986, ittehat was made in 1990s.

PIA has do zero maintenance of their planes due to low budget, they spend more and earn less. One reason of less earning is:

—> they have just 24 planes. At first they have 48 planes. Among 24, 16 are operational, so that's why planes are less in number

—> other airlines do outsourcing of their maintenance and customer services but in pakistan there is no such facility. Everything is done inhome, that's why they are unable to manage properly.

### **EXCESSIVE STAFF:**

If we just fire the staff of service handling, about 4000 people will be removed from PIA. About 1500 people are for kitchen handling, and in all other countries, these services are outsourced.

Even PIA has its own medical division. There is a general manager, alot of doctors and nurses and other medical staff. This medical staff cover working and retired employees of PIA, although medical facilities are provided by state. At first, they even have diagnostic labs and hospitals where some surgeries also took placed.

PIA has its own printing press and even horticulture center. These employees were first appointed as normal workers but noe they are progressed to become officers in PIA. And that most surprise thing is that all these workers are officially part of PIA employees and they get same facilities as the core employees of PIA get. For kitchen, PIA had its own poultry farm but now it is closed.

We only need supervisors but we are losing a lot of money because we are not doing outsourcing. The employees who are doing core functions are also excessive in number.

### **RISE OF PROBLEMS:**

Actually, problems arises from 1991 when there was an era of Nawaz Sharif. He was inspired by the airport of singapore. Singapore is a city state so they did open sky (means a country can easily operate unlimited flights to and from that state). Nawas sharif announced that we will also do open skying in Karachi. Dubai, singapore, morocco and all other city states required open skying so that alot of passengers come to visit and they earn money from them. But Pakistan is not a city state. So open skying is not good for us. But the good thing is that after facing alot of losses, open skying were stopped.

PIA employees has a bad mentality. The managers consider themselves as commissioners and are not in a condition to compete. Because at first when there was no gulf airlines, there was no competitor but due to emergence of emirates, qatar airlines and tawaqqal, PIA was lost completely.

PIA faced 800 Arab rupee loss and if PIA earn profit for 100 years but still it wouldn't be able to fulfil that loss. Every minister is in the thought to improve PIA just for 2 to 3 months so that he can become a good minister in front of people but no one has made a single attempt to made a long lasting strategy to improve permanently.

If 10 planes can carry only 15 flights they claim that we can carry 40 flights. The code sharing scheme of pia and THY was not accepted by gulf airlines and they stand a huge strike and this scheme was dropped by pia and thy but if it was not dropped pia was able to apply for star airlines.

If this scheme was not dropped pia can bring their flights to Bangkok dhaka and Bengal which can reduce highly gap between PIA and star airlines standard which was a very good step but gulf airlines became a huge unbreakable blockage.

Associations and unions start dictation outside the airport and due to this passengers were unable to go in and out and flights started to stop. This was a huge pressure on PIA so that scheme was dropped.

PELPA pilots association mafia and due to their semi god like behaviour, they don't compromise on duty Timmig more than 10 hours and when time is like 10 to fifteen minutes greater than 10 hours they say we need a break, and PIA have to pay to them. The other thing pia pilots say we can't work more than 30 hours weekly.

PIA faced difficulty in serving the employee, there mafia attitude was a big reason behind downfall. PIA staff manager doesn't even visited their offices as they we in self served palaces their attitude and behavior being as we are God father of PIA we can do what ever we want.

New staff hiring also creates problems due to lack of experience.

Another reason was PIA salaries which was very very low, only 6% of revenue from which 1.25 percent includes pilot salaries and pilots are round about 200-250 of whole PIA staff.

Corruption is one of the most issue that PIA is facing. They demand for the same equipment for 3 to 4 time but they buy only one time and other payments they take by their self.



## RESULT OF SURVEYS:

In 2011, there was a survey from many international passengers. Actually survey mostly covers 10-15% of passengers but this survey cover about 98% of passengers. They are provided with questionnaire and asked why they selected other airlines instead of PIA. Actually these passengers also travelled in PIA for one or two times. The outcome of the survey includes interesting facts because the outcome is that:

- PIA has a very bad service
- number of flights per week is a huge problem
- PIA don't serve alot of destinations. In germany, there are about 5-6 destinations where Pakistanis mostly visit but PIA only covers one to two destinations from it, it means we are losing a lot of passengers.
- many international passengers who are students said that they don't want to travel in PIA because they are not served with alcohol.

## BANS ON PIA:

In 2008, PIA was banned from Europe and it is a very big issue because Europe is a big hub for us. Because of security issues. Civil aviation authority of EU noticed that the plane has a maintenance issue but we neglected that warning and next time again take off that plane to Rome which create serious problem.

## **SOLUTION:**

After 2008, we did nothing but losing money. The criterion of every government is to privatise departments. In recent years, PIA consider to progress by unveiling and printing the news of fake degree scandals. But this is not a solution, you need to rebuild airline, have to buy new planes and need a lot of maintenance.

PIA should need a lot of outsourcing for managing kitchen, maintenance and many more.

Streamlining operations, optimizing flight schedules, and ensuring on-time departures can improve efficiency and customer satisfaction. This includes maintenance of aircraft to prevent delays and cancellations.

Buying new planes can reduce the issue of timetable and departure of flights.

Embrace technology advancements to improve booking systems, enhance in-flight entertainment, and offer more personalized services to passengers.

Investing in effective marketing campaigns and strengthening the brand image can attract more passengers and create positive perceptions in the market.

## **SOLVING PROBLEMS USING 6 SIGMA:**

DMAIC (Define, Measure, Analyze, Improve, Control) is a structured problem-solving methodology used in Six Sigma. Applying DMAIC to PIA (Pakistan International Airlines) can do a lot of improvements.

### **DEFINE:**

First of all in this phase, select one problem to solve. We have accentuated a lot of problems above. Let's consider the issue of number of flights per week and flight delays because they are the main reason that reduces the amount of passengers to travel. Clearly outlines the goals and objectives to solve that issue.

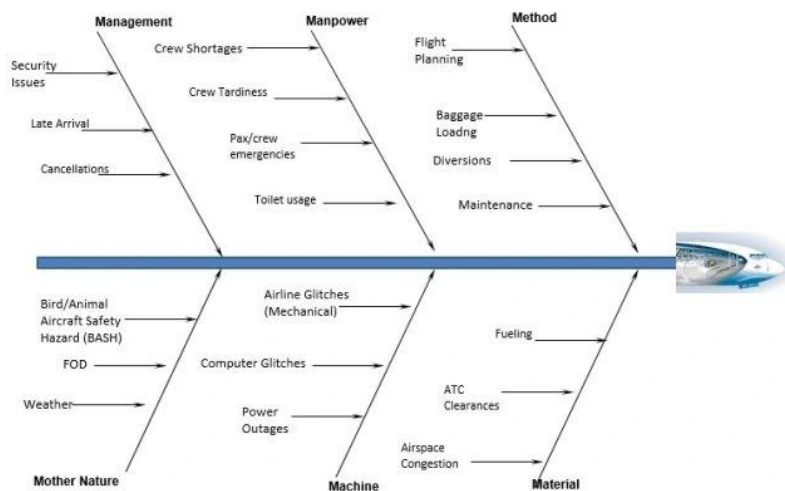
### **MEASURE:**

This phase involves Gathering and analysing relevant data to that issue. In this case, checking the past history of flight delays and problems created by the issue of less number of flights per week.

- **Around 250 flights were canceled between 14 and 22 October, 2023. But the irony is the aviation ministry and PIA administration are mysteriously silent and have no answers to the questions on the crisis.**
- **71 flights of PIA were canceled in one day in 2023, so much uncertainty was not seen even during COVID-19.**
- **The national flag carrier is facing arguably its worst crisis in history as Pakistan State Oil (PSO) has cut the fuel supply over unpaid dues.**

### **ANALYZE:**

This phase involves using mathematical tools and terminologies to analyse the data collected. In this case, if flight delays are an issue, analyze the reasons behind them which may be maintenance issues, scheduling problems, or other factors. Most flight delays occur due to maintenance issue. In past when PIA was banned from Europe, maintenance was the main issue. PIA flew the plane that was out of order first to UK and then to Rome. If the plane was first to go to maintenance, then the reason of next flight cancellation issues arose due to the low number of planes.



### IMPROVE:

This involves developing and implementing solutions based on the analysis. This might involve process improvements, changes in procedures, or introducing new technologies.

In case of flight delays and maintenance issues, the solution that emerges is to buy new planes. But this issue is related to the issue of less budget. Budget can be improved by:

- Getting help from government.
- Reducing the expenses of PIA itself. For example: as mentioned above that PIA has its own printing press department, horticulture department and hospital, it has to reduce those expenses. The medical facilities of working employees and current employees is the duty of government, not the department in which they are serving.

By getting improvement in budget, PIA should:

- Buy new planes and advanced technologies
- Advanced technologies should help to guess some unpredicted conditions such as the exact weather of a week or two so that system should take precautionary measures.

### CONTROL:

This phase involves establishing control mechanisms to monitor the effectiveness of the implemented solutions continuously. Implement checks and balances to ensure that the improvements remain consistent over time.

After getting some improvements, regular audits and feedbacks from passengers should be taken on regular intervals so that any other problem can be improved.



# UNIVERSITY OF SARGODHA

## **Project Title**

BPE : Airlines Management System

Submitted to: SIR SAUD BIN TAHIR

Submitted by: Nimra Iman (BSSE51F21S004)

Syeda Tayyaba Rubab (BSSE51F21S023)

# BPE Airlines Management System Documentation

## Project Title

BPE : Airlines Management System

## Project Purpose

We created a system to help airlines work better. It makes booking flights, managing crews, and helping passengers easier.

### Contents

1. Introduction
2. What We're Doing
3. How It Works
4. What It Does
5. Who Uses It
6. What We Used
7. How We Store Info
8. How It Looks
9. How We Keep It Safe
10. Making Sure It Works

#### 1. Introduction

Our goal is to make airlines better. We made a system that helps with booking flights, managing crews, and making passengers happy.

#### 2. What We're Doing

Our system covers everything airlines need: booking flights, managing crews, helping passengers, and even checking how things are going.

#### 3. How It Works

Airlines in Pakistan including PIA have many flaws therefore we have decided to make a system that is more flexible in its management and everything.

#### 4. What It Does

It helps with booking flights, making sure crews are where they need to be, tracking baggage, checking in passengers, and showing real-time flight updates. There's also a dashboard for airlines to see how things are going.

#### 5. Who Uses It

Different people use the system. Some manage everything, some take care of flights, some help passengers, and some just want to check their flight info.

#### 6. What We Used

We used some tools to build this - like **six sigma**, **DMAIC**, and **MySQL** to store information.

### 7. How We Store Info

We keep information in a smart way using PostgreSQL. It has different tables for flights, bookings, passengers, and crews.

### 8. How It Looks

The system looks nice and is easy to use on computers or phones. We made sure it works well for everyone.

### 9. How We Keep It Safe

We put on a virtual lock and key to keep information safe. Only the right people can access it.

### 10. Making Sure It Works

We tested it a lot to make sure it doesn't have problems. Like checking each part to make sure it does its job.

### 11. Getting It Out There

We put it on the internet so airlines can use it. It's like setting up a shop - now everyone can come and use it.

## Overview

Our system helps airlines be better, which is what the business plan wants. Involves deciding the name, type of planes and other parameters.

## Production

It helps airlines work well by managing crews, saving money, and making sure everything runs smoothly.

## Marketing

Airlines can use our system to make passengers happy and show they're a good choice. This helps them attract more customers.

## Financials

Our system can save airlines money by making things more efficient. This is good for their finances.

## Scalability

Our system can grow with airlines if they get bigger. It's like adding more rooms to a house when the family grows.

Our system is here to make airlines better. It helps with booking flights, managing crews, and making passengers happy. It fits with what airlines want to achieve.

# UNIVERSITY OF SARGODHA

## **Assignment of Entrepreneurship**

Submitted by:

MAHNOOR FATIMA  
(BSSE51F21S011)

Submitted to:

Mr. Badar



**Identified Issue:**

David notices a problem with plastic pollution in oceans and waterways, mostly from single-use plastic bottles.

**Proposed Solution:**

He introduces the "EcoHydrate Bottle," a water bottle made from plant-based materials that break down naturally and can be used in compost.

**Background and Resources:**

David studied environmental science and researched sustainable materials and production methods. He teamed up with a bioengineering company to create the EcoHydrate Bottle and got patents for his technology.

**First mover Advantage:**

Although there are other eco-friendly bottles out there, the EcoHydrate Bottle stands out for being both biodegradable and compostable. People like that David cares about the environment.

**Value created:**

The EcoHydrate Bottle offers a green option to regular plastic bottles, reducing waste and helping the environment.

**Financial Numbers:**

David's company made \$200,000 in sales last year, with a profit of 30%. He wants \$300,000 for a 25% stake to expand marketing and production.

**Further Suggestions:**

The investors like David's idea but worry about costs and growth. They suggest teaming up with beverage companies or stores to reach more people and cut costs. In the end, Kevin O'Leary offers \$300,000 for a 30% stake, promising to help David expand his business smartly.

# UNIVERSITY OF SARGODHA

## **Assignment of Entrepreneurship**

Submitted by:

NIMRA IMAN  
(BSSE51F21S004)

Submitted to:

Mr. Badar

## **Entrepreneurs: Sarah and Jason Thompson**

### **Problem identified:**

Sarah and Jason identify the problem of food waste in households, where a significant amount of food is thrown away due to spoilage or improper storage.

### **Solution or product in return:**

They present their solution, the "FreshSaver Vacuum Sealer," a compact vacuum sealing system that extends the shelf life of perishable foods by removing air and sealing them in airtight bags. Pasteurised food preservation techniques require different temperature for different food products, so these "FreshSaver Vacuum Sealer" take care of it.

### **Knowledge and resources:**

Sarah has a background in culinary arts, and Jason has experience in product design and manufacturing. They have spent years researching food preservation methods and developing prototypes for the FreshSaver Vacuum Sealer.

### **First mover Advantage:**

While vacuum sealers are available on the market, FreshSaver's sleek design and user-friendly features set it apart. Sarah and Jason's focus on simplicity and affordability make their product appealing to a wide range of consumers.

### **Value created:**

The FreshSaver Vacuum Sealer helps households reduce food waste and save money by extending the freshness of perishable items such as fruits, vegetables, and meats.

### **Financial Numbers:**

Sarah and Jason's company has generated \$300,000 in revenue in the past year, with a net profit of 25%. They are seeking a \$500,000 investment in exchange for a 20% equity stake to fund marketing initiatives and expand distribution channels.

### **Any further suggestion:**

The Sharks are impressed by Sarah and Jason's product but express concerns about market saturation and competition from larger appliance manufacturers. They suggest focusing on building brand awareness and loyalty through targeted advertising and social media campaigns. Ultimately, one shark makes an offer, and Sarah and Jason accept a deal for \$500,000 in exchange for a 25% equity stake. Shark agrees to provide funding and guidance to help them scale their business and navigate the competitive landscape in the kitchen appliance industry.